

ECM 101

ISLAMIC

NONOMIICS

STUDENT HANDOUT

PART

Part One

Session 2

What is Economics?

Markets and Government in the Mixed Economy

Micro and Macro Economics

The Basic Competitive Model

Prices, Property Rights, and Profits

Rationing

Cost

Opportunity Cost

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WHAT IS ECONOMICS ? • 9

THE AUTOMOBILE AND ECONOMICS (CH. 1)

WHAT IS ECONOMICS?

This narrative illustrates many facets of economics, but now a definition of our subject is in order. Economics studies how individuals, firms, governments, and other organizations within our society make choices, and how those choices determine the way the resources of society are used. Scarcity figures prominently in economics: choices matter because resources are scarce. Imagine an enormously wealthy individual who can have everything he wants. We might think that scarcity is not in his vocabulary until we consider that time is a resource, and he must decide what expensive toy to devote his time to each day. Taking time into account, then, scarcity is a fact in everyone's life.

To produce a single product, like an automobile, thousands of decisions and choices have to be made. Since any economy is made up not only of automobiles but of millions of products, it is a marvel that the economy functions at all, let alone as well as it does most of the time. This marvel is particularly clear if you consider instances when things do not work so well: the Great Depression in the United States in the 1930s, when 25 percent of the work force could not find a job; the countries of the former Soviet Union today, where ordinary consumer goods like carrots or toilet paper are often simply unavailable; the less developed economies of many countries in Africa, Asia, and Latin America, where standards of living have remained stubbornly low, and in some places have even been declining.

The fact that choices must be made applies as well to the economy as a whole as it does to each individual. Somehow, decisions are made — by individuals, households, firms, and government — that together determine how the economy's limited resources, including its land, labor, machines, oil, and other natural resources, are used. Why is it that land used at one time for growing crops may, at another time, be used for an automobile plant? How was it that over the space of a couple of decades, resources were transferred from making horse carriages to making automobile bodies? that blacksmiths were replaced by auto mechanics? How do the decisions of millions of consumers, workers, investors, managers, and government officials all interact to determine the use of the scarce resources available to society? Economists reduce such matters to four basic questions concerning how economies function:

1. *What is produced, and in what quantities?* There have been important changes in consumption over the past fifty years. Spending for medical care, for example, was only 3.5 percent of total personal consumption in 1950. By 1995, more than one out of every seven dollars was spent on medical care. What can account for changes like these? The economy seems to spew out new products like videocassette recorders and new services like automated bank tellers. What causes this process of innovation? The overall level of production has also shifted from year to year, often accompanied by large changes in the levels of employment and unemployment. How can economists explain these changes?

In the United States, the question of what is produced, and in what quantities, is answered largely by the private interactions of firms and consumers but government also plays a role. Prices are critical in determining what goods are produced. When the price of some goods rises, firms are induced to produce more of that good, to increase their profits. Thus, a central question for economists is, why are some goods more expensive than others? And why have the prices of some goods increased or decreased?

2. *How are these goods produced?* There are often many ways of making something. Textiles can be made with hand looms. Modern machines enable fewer workers to produce more cloth. Very modern machines may be highly computerized, allowing one worker to monitor many more machines than was possible earlier. The better machines generally cost more, but they require less labor. Which technique will be used, the advanced technology or the labor-intensive one? Henry Ford introduced the assembly line. More recently, car manufacturers have begun using robots. What determines how rapidly technology changes?

In the U.S. economy, firms answer the question of how goods are produced, again with input from the government, which sets regulations and enacts laws that affect everything from the overall organization of firms to the ways they interact their employees and customers.

3. *For whom are these goods produced?* In the United States, individuals who have higher incomes can consume more goods. But that answer only pushes the question back one step: What determines the differences in income and wages? What is the role of luck? of education? of inheritance? of savings? of experience and hard work? These questions are difficult to answer. For now, suffice it to say that while incomes are primarily determined by the private interaction of firms and households in the United States, government also plays a strong role, with taxes as well as programs that redistribute income.

Figure 1.4 shows the relative pay in a variety of different occupations. To judge by income, each physician receives five times as much of the economy's output as a firefighter, and seven times as much as a butcher.

4. *Who makes economic decisions, and by what Process?* In a **centrally planned economy**, as the Soviet Union was, the government takes responsibility for virtually every aspect of economic activity. The government provides the answers to the first three questions. A central economic planning agency works through a bureaucracy to say what will be produced and by what method, and who shall consume it. At the other end of the spectrum are economies that rely primarily on the free interchange of producers and their customers

<p>Figure.4 WHO TAKES HOME AMERICA S OUTPUT?</p> <p>This chat measures tie earnings of a variety of professions relative to the wages of an average worker. Firefighters make 25 percent more than an average worker, while physicians make over six times as much.</p>	<p>RATIO OF ECONOMY AVERAGE (%)</p> <p>Average (100)</p> <p>Unskilled Butchers Firefighters Computer programmers Airline Pilots Physicians</p>
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BASIC QUESTIONS OF ECONOMICS

1. What is produced, and in what quantities?	3. For whom are these goods produced?
2. How are these goods produced?	4. Who makes economic decisions, and by what process?

to determine what, how, and for whom. The United States, which lies near this latter end, has a mixed economy; that is, a **mix between public** (governmental) and private decision making. Within limits, producers make what they want; they use whatever method of production seems appropriate to them; and the output is distributed to consumers according to their income.

When economists examine an economy, they want to know to what extent economic decisions are made by the government, and to what extent they are made by private individuals. In the United States, while individuals for the most part make their own decisions about what kind of car to purchase, the government has inserted itself in a number of ways: it has taken actions that affect the import of Japanese cars, that restrict the amount of pollutants a car can produce, and that promote fuel efficiency and automobile safety.

A related question is whether economic decisions are made by individuals for their own interests or for the interest of an employer such as a business firm or government agency. This is an important distinction. We can expect people acting on their own behalf to make decisions that benefit themselves. When they act on behalf of organizations, however, a conflict of interest may arise. Observers often refer to corporations and governments as if they were a single individual. Economists point out that organizations consist, by definition, of a multitude of individuals and that the interests of these individuals do not necessarily coincide with one another or, for that matter, with the interests of the organization itself. Organizations bring a number of distinctive problems to the analysis of choice.

As you can see by their concern with decision making, economists are concerned not only how the economy answers the four basic questions, but also how well. They ask, is the economy efficient? Could it produce more of some goods without producing fewer of others? Could it make some individuals better off without making some other individuals worse off?

MARKETS AND GOVERNMENT - I N THE MIXED ECONOMY

The primary reliance on private decision in the United States reflects economists' beliefs that this reliance is appropriate and necessary for economic efficiency; however, economists also believe that certain interventions by government are desirable. Finding the appropriate balance between the public and the private sectors of the economy is a central issue of economic analysis.

MARKETS

The economic concept of markets is used to include any situation where exchange takes place, through this exchange may not necessarily resemble the traditional village markets. In department stores and shopping malls, customers rarely haggle over the price. When manufacturers purchase the materials they need for production, they exchange money for them, not other goods. Most goods, from cameras to clothes, are not sold directly from producers to consumers. They are sold from producers to distributors, from distributors to retailers, from retailers to consumers. All of these transactions are embraced by the concepts of **market** and **market economy**.

In market economies with competition, individuals make choices that reflect their own desires. And firms make

choices that maximize their profits; to do so, they must produce the goods consumers want, and they must produce them at lower cost than other firms. As firms compete in the quest for profits, consumers benefit, both from the kinds of goods produced and the prices at which they are supplied. The market economy thus provides answers to the four basic economic questions — what is produced, how it is produced, for whom it is produced, and how these decisions are made. And on the whole, the answers the market gives ensure the efficiency of the economy.

But the answer the market provides to the question of for whom goods are produced is one that not everyone finds acceptable. Like bidders at an auction, what market participants are willing and able to pay depends on their income. Some groups of individuals — including those without skills that are valued by the market — may receive such a low income that they could not feed and educate their children without outside assistance. Government provides the assistance by taking steps to increase income equality. These steps, however, often blunt economic incentives. While welfare payments provide an important safety net for the poor, the taxation required to finance them may discourage work and savings. If the government takes one out of three or even two dollars that an individual earns, that individual may not be inclined to work so much. And if the government takes one out of two or three dollar a person earns from interest on savings, the person may decide to spend more and save less. Like the appropriate balance between the public and private sectors, the appropriate balance between concerns about equality (often referred to as equity concerns) and efficiency is a central issue of modern economics.

THE ROLE OF GOVERNMENT

The answers to the basic economic questions that the market provides on the whole ensure efficiency. But in certain areas the solutions appear inadequate to many. There may be too much pollution, too much inequality, and too little concern about education, health, and safety. When the market is not perceived to be working well, people often turn to government.

The government plays a major role in modern economies. We need to understand both what that role is and why government undertakes the activities that it does. The story of the automobile provides several instances. Early on, George Baldwin Selden was almost able to use government-created patent laws to change the course of the industry. In the late 1970s, government loan guarantees enabled Chrysler to survive. The automobile industry was helped by government restrictions on Japanese imports but probably hurt by government regulations concerning pollution. The strength of the auto unions, reflected in their success in raising wages to high levels, was partly a result of the rights that federal legislation had granted to them. Later on we will see more ways in which government policy has affected industry.

The U.S. government sets the legal structure under which private firms and individuals operate. It regulates businesses to ensure that they do not discriminate by race or sex, do not mislead customers, are careful about the safety of their employees, and do not pollute air and water. In some industries, the government operates like a private business: the government-owned Tennessee Valley Authority (TVA) is one of the nation's largest producers of electricity; most children attend government-owned public schools; and most mail is still delivered by the government-owned post office. In other cases, the government supplies goods and services that the private sector does not, such as providing for the national defense, building roads, and printing money. Government programs provide for the elderly through Social Security (which pays income to retired individuals) and Medicare (which funds medical needs of the aged). The government helps those who have suffered economic dislocation, through unemployment insurance for those temporarily unemployed and disability insurance for those who are no longer able to work. The government also provides a safety net of support for the poor, particularly children, through various welfare programs.

One can easily imagine a government controlling the economy more directly. In countries where decision-making authority is centralized and concentrated in the government, government bureaucrats might decide what and how much a factory should produce and set the level of wages that should be paid. Various European governments run steel companies, coal mines, and the telephone system. At least until recently, governments in countries like the former Soviet Union and China attempted to control practically all major decisions regarding resource allocation.

CHAPTER 2

THINKING LIKE AN ECONOMIST

Everyone thinks about economics, at least some of the time. We think about money (we wish we had more of it) and about work (we wish we had less of it). But there is a distinctive way that economists approach economic issues, and one of the purposes of this course is to introduce you to that way of thinking. This chapter begins with a basic model of the economy. We follow this with a closer look at how the basic units that comprise the economy - individuals, firms, and governments - make choices in situations where they are faced with scarcity. In Chapters 3 through 5, we study ways in which these units interact with one another, and how those interactions “add up” to determine how society’s resources are allocated.

KEY QUESTIONS

1. What is the basic competitive model of the economy?
2. What are incentives, property rights, prices, and the profit motive, and what roles do these essential ingredients of a market economy play?
3. What alternatives for allocating resources are there to the market system, and why do economists tend not to favor these alternatives?

4. What are some of the basic techniques economists use in their study of how people make choices? What are the various concepts of costs that economists use?

THE BASIC COMPETITIVE MODEL

Though different economists employ different Models of the economy they all use a basic set of assumptions as a point of departure. The economist's basic competitive model has three components: assumptions about how consumers behave, assumptions about how firms behave, and assumptions about the markets in which these consumers and firms interact. The model ignores government, because we need to see how an economy without a government might function before we can understand the role of government.

RATIONAL CONSUMERS AND PROFIT - MAXIMIZING FIRMS

Scarcity, which we encountered in Chapter 1, implies that individuals and firms must make choices. Underlying much of economic analysis is the basic assumption of rational choice, that people weigh the costs and benefits of each possibility. This assumption is based on the expectation that individuals and firms will act in a consistent manner, with a reasonably well-defined notion of what they like and what their objectives are, and with a reasonable understanding

of how to attain those objectives.

In the case of an individual, the rationality assumption is taken to mean that he makes choices and decisions in pursuit of his own self-interest. Different people will, of course, have different goals and desires. Sally may want to drive a Porsche, own a yacht, and have a large house; to attain those objectives, she knows she needs to work long hours and sacrifice time with her family. Andrew is willing to accept a lower income to get longer vacations and more leisure throughout the year.

Economists make no judgments about whether Sally's preferences are "better" or "worse" than Andrew's. They do not even spend much time asking why different individuals have different views on these matters, or why tastes change over time. These are important questions, but they are more the province of psychology and sociology. What economists are concerned about are the consequences of these different preferences. What decisions can they expect Sally and Andrew, rationally pursuing their respective interests, to make?

In the case of firms, the rationality assumption is taken to mean that firms operate to maximize their profits.

COMPETITIVE MARKETS

To complete the model, economists make assumptions about the places where self-interested consumers and profit-maximizing firms meet: markets. Economists begin by focusing on the case where there are many buyers and sellers, all buying and selling the same thing. You might picture a crowded farmer's market to get a sense of the number of buyers and sellers — except that you have to picture everyone buying and selling just one good. Let's say we are in Florida, and the booths are all full of oranges.

Each of the farmers would like to raise his prices. That way, if he can still sell his oranges, his profits go up. Yet with a large number of sellers, each is forced to charge close to the same price, since if any farmer charged much more, he would lose business to the farmer next door. Profit-maximizing firms are in the same position. In an extreme case, if a firm charged any more than the going price, it would lose *all* its sales. Economists label this case **perfect competition**. In perfect competition, each firm is a **price taker**, which simply means that because it cannot influence the market price, it must accept that price. The firm takes the market price as given because it cannot raise its price without losing all sales, and at the market price it can sell as much as it wishes. Even if it sold ten times as much, this would have a negligible effect on the total quantity marketed or the price prevailing in the market. Markets for agricultural goods would be, in the absence of government intervention, perfectly competitive. There are so many wheat farmers, for instance, that each farmer believes he can grow and sell as much wheat as he wishes and have no effect on the price of wheat. (Later in the book, we will encounter markets with limited or no competition, like monopolies, where firms can raise prices without losing all their sales.)

On the other side of our farmers' market are rational individuals, each of whom would like to pay as little as possible for her oranges. Why can't she pay less than the going price? Because the seller sees another buyer in the crowd who will pay the going price. Thus, the consumers also take the market price as given, and focus their attention on other factors — their taste for oranges, primarily — in deciding how many to buy.

This model of consumers, firms, and markets — rational, self-interested consumers interacting with rational, profit-maximizing firms, in competitive markets where firms and consumers are both price takers — is the basic competitive model. The model has one very strong implication: if actual markets are well described by the competitive model, then the economy will be efficient: resources are not wasted, it is not possible to produce one good without producing less of another, and it is not even possible to make anyone better off without making someone else worse off. These results are obtained without government.

Virtually all economists recognize that actual economies are not perfectly described by the competitive model, but most still use it as a convenient benchmark — as we will throughout this book. We will also point out important differences between the predictions of the competitive model and observed outcomes, which will guide us to other models which provide a better description of particular markets and situations. Economists recognize too that, while the competitive model may not provide a perfect description of some markets, it may provide a good description—with its predictions matching actual outcomes well, though not perfectly. As we shall see, economists differ in their views about how many such markets there are, how good the "match" is, and how well alternative

models do in rectifying the deficiencies of the competitive model in particular cases.

INGREDIENTS THE BASIC COMPETITIVE MODEL

1. Rational, self-interested consumers
2. Rational profit-maximizing firms
3. Competitive markets with price-taking behavior

PRICES, PROPERTY RIGHTS , AND PROFITS : INCENTIVES AND INFORMATION

For market economies to work efficiently, firms and individuals must be informed and have incentives to act on available information. Indeed, incentives can be viewed as at the heart of economics. Without incentives, why would individuals go to work in the morning? Who would undertake the risks of bringing out new products? Who would put aside savings for a rainy day? There is an old expression about the importance of having someone “mind the store.” But without incentives, why would anyone bother?

Market economies provide information and incentives through prices, profits, and property rights. Prices provide information about the relative scarcity of different goods. The price system ensures that goods go to those individuals and firms who are most willing and able to pay for them. Prices convey information to firms about how individuals value different goods.

The desire for profits motivates firms to respond to the information provided by prices. By producing what consumers want in the most efficient way, in ways that least use scarce resources, they increase their profits. Similarly, rational individuals' pursuit of self-interest induces them to respond to prices: they buy goods which are more expensive — in a sense relatively more scarce — only if they provide commensurately greater benefits.

For the profit motive to be effective, firms need to be able to keep at least some of their profits. Households, in turn, need to be able to keep at least some of what they earn or receive as a return on their investments. (The return on their investments is simply what they receive back in excess of what they invested. If they receive back less than they invested, the return is negative.) There must, in short, be **private property**, with its attendant property rights. Property rights include both the right of the owner to use the property as she sees fit and the right to sell it.

These two attributes of property rights give individuals the incentive to use property under their control efficiently. The owner of a piece of land tries to figure out the most profitable use of the land; for example, whether to build a store or a restaurant. If he makes a mistake and opens a restaurant when he should have opened a store, he bears the consequences: the loss in income. The profits he earns if he makes the right decisions — and the losses he bears if he makes the ones — give him an incentive to think carefully about the decision and do the requisite research. The owner of a store tries to make sure that her customers get the kind of merchandise and the quality of service they want. She has an incentive to establish a good reputation, because if she does so, she will do more business and earn more profits.

The store owner will also want to maintain her property — which is not just the land anymore, but includes the store as well — because she will get more for it when the time comes to sell her business to someone else. Similarly, the owner of a house has an incentive to maintain his property, so that he can sell it for more when he wishes to move. Again, the profit motive combines with private property to provide incentives.

HOW THE PROFIT MOTIVE DRIVES THE MARKET SYSTEM

In market economies, incentives are supplied to individuals and firms by prices, profits, and property rights.

INCENTIVES VERSUS EQUALITY

While incentives are at the heart of market economies, they come with a cost: inequality. Any system of incentives must tie compensation with performance. Whether through differences in luck or ability, performance of different individuals will differ. In many cases, it will not be possible to identify why performance is high. The salesperson may claim that the reason his sales are high is superior skill and effort, while his colleague may argue that it is dumb luck.

If pay is tied to performance, there will inevitably be some inequality. And the more closely compensation is tied to performance the greater the inequality. The fact that the greater the incentives, the greater the resulting inequality is called the **incentive-equality trade-off**. If society provides greater incentives, total output is likely to be higher, but there will also probably be greater inequality.

One of the basic questions facing society in the choice of tax rates and welfare systems is how much would incentives be diminished by an increase in tax rates to finance a better welfare system and thus reduce inequality? What would be the results of those reduced incentives?

WHEN PROPERTY RIGHTS FAIL

Prices, profits, and property rights are the three essential ingredients of market economies. We can learn a lot about why they are so important by examining a few cases where property rights and prices are interfered with. Each example highlights a general point. Any time society fails to define the owner of its resources and does not allow the highest bidder to use them, inefficiencies result. Resources will be wasted or not used in the most productive way.

Ill-Defined Property Rights: The Grand Banks Fish are a valuable resource. Not long ago, the area between Newfoundland and Maine, called the Grand Banks, was teeming with fish. Not surprisingly, it was also teeming with fishermen, who saw an easy livelihood scooping out the fish from the sea. Since there were no property rights, everyone tried to catch as many fish as he could. A self-interested fisherman would rationally reason that if he did not catch the fish, someone else would. The result was a tragedy: the Grand Banks was overfished, to the point where not only was it not teeming with fish, but commercial fishing became unprofitable. Today Canada and the United States have a treaty limiting the amount of fish that fishermen from each country can take from the Grand Banks, and gradually over the years, the fish population has been restored.

Restricted Property Rights In California the government allocates water rights among various groups. Water is scarce. Hence these rights to water are extremely valuable. But they come with a restriction. They are not transferable; they cannot be sold. Cattle ranchers currently have the right to about 10 percent of the state's water, slightly less than the fraction consumed by residences. Government charges ranchers as little as \$50 per acre-foot for their water, in contrast to \$256 per acre-foot charged to residences in San Francisco and much more in some towns. The value of water to thirsty urban consumers — what they would be willing to pay for the additional water — exceeds the profits from raising cattle. If the water rights could be sold, those in the cattle industry would have a strong incentive to sell their rights to the towns. If cattle owners could get out of the cattle business and sell their water rights to urban residents instead, everyone would be better off.¹ In this case, restrictions on property rights

¹ The calculation of benefits and losses does not take into account the feelings of the cattle.

have led to inefficiencies.

Entitlements as Property Rights

Property rights do not always mean that you have full ownership or control. A **legal entitlement**, such as the right to occupy an apartment for life at a rent that is controlled, common in some large cities, is viewed by economists as a property right. Individuals do not own the apartment and thus cannot sell it, but they cannot be thrown out, either.

These partial and restricted property rights result in many inefficiencies. Because the individual in a rent-controlled apartment cannot (legally) sell the right to live in her apartment, as she gets older she may have limited incentives to maintain its condition, let alone improve it.

CONSENSUS ON INCENTIVES

Incentives, prices, profits, and property rights are central features of any economy, and highlight an important area of consensus among economists. This brings us to our second point of consensus:

2 Incentives

Providing appropriate incentives is a fundamental economic problem. In modern market economies, profits provide incentives for firms to produce the goods individuals want, and wages provide incentives for individuals to work. Property rights also provide people with important incentives, not only to invest and to save, but to put their assets to the best possible use.

RATIONING

The price system is only one way of allocating resources, and a comparison with other systems will help to clarify the advantages of markets. When individuals get less of a good than they would like at the terms being offered, the good is said to be rationed. Different rationing schemes are different ways of deciding who gets society's scarce resources.

Rationing by Queues Rather than supplying goods to those willing and able to pay the most for them, a society could give them instead to those most willing to wait in line. This system is called **rationing by queues**, after the British term for lines. Tickets are often allocated by queues, whether they are for movies, sporting events, or rock concerts. A price is set, and it will not change no matter how many people line up to buy at that price. (The high price that scalpers can get for "hot" tickets is a good indication of how much more than the ticket price people would have been willing to pay.)

Rationing by queues is thought by many to be a more desirable way of supplying medical services than the price system. Why, it is argued, should the rich — who are most able to pay for medical services — be the ones to get better or more medical care? Using this reasoning, Britain provides free medical care to everyone on its soil. To see a doctor there, all you have to do is wait in line. Rationing medicine by queues turns the allocation problem around: since the value of time for low-wage workers is lower, they are more willing to wait, and therefore they get a disproportionate share of (government-supplied) medical services.

In general rationing by queues is an inefficient way of distributing resources because the time spent in line is a wasted resource. There are usually ways of achieving the same goal within a price system that can make everyone better off. Returning to the medical example, if some individuals were allowed to pay for doctors' services instead of waiting in line, more doctors could be hired with the proceeds, and the lines for those unable or unwilling to pay could actually be reduced.

Rationing by Lotteries

Lotteries allocate goods by a random process, like picking a name from a hat.

University dormitory rooms are usually assigned by lottery. So are seats in popular courses; when more students want to enroll in a section of a principles of economics course than the size of the section allows, there may be a lottery to determine who gets to enroll. The United States used to allocate certain mining rights and licenses to radio airwaves by lottery. Like queue systems, lotteries are thought to be fair because everyone has an equal chance. However, they are also inefficient, because the scarce resources do not go to the individual or firm who is willing and able to pay (and therefore values them) the most.

Rationing by Coupons Most governments in wartime use **coupon rationing**. People are allowed so many gallons of gasoline, so many pounds of sugar, and so much flour each month. To get the good, you have to pay the market price and produce a coupon. The reason for coupon rationing is that without coupons prices might soar, inflicting a hardship on poorer members of society.

Coupon systems take two forms depending on whether coupons are tradable or not. Coupons that are not tradable give rise to the same inefficiency that occurs with most of the other nonprice systems — goods do not in general go to the individuals who are willing and able to pay the most. There is generally for a trade that will make all parties better off. For instance, I might be willing to trade some of my flour ration for some of your sugar ration. But in a nontradable coupon system, the law prohibits such transactions. When coupons cannot be legally traded, there are strong incentives for the establishment of a black market, an illegal market in which the goods or the coupons for goods are traded.

INEFFICIENCIES: BEING OFF THE PRODUCTION POSSIBILITIES CURVE

There is no reason to assume that a firm or an economy will always be on its production possibilities curve. Any inefficiency in the economy will result in a point such as A in Figure 2.4, below the production possibilities curve. One of the major quests of economists is to look for instances in which the economy is inefficient in this ways.

Whenever the economy is operating below the production possibilities curve, it is possible for us to have more of every good - more wheat and more corn, more guns and more butter. No matter what goods we like, we can have more of them. That is why we can unambiguously say that points below the production possibilities curve are undesirable. But this does not mean that every point on the production possibilities curve is better than any point below it. Compare points A and C in Figure 2.4. Corn production is higher at C, but wheat production is lower. If people do not like corn very much, the increased corn production may not adequately compensate them for the decreased wheat production.

There are many reasons why the economy may be below the production possibilities curve. If land better suited for the production of corn is mistakenly devoted to the production of wheat, the economy will operate below its production possibilities curve. If some of society's resources - its land, labor, and capital goods - are simply left idle, as happens when there is a depression, the economy operates below the production possibilities curve. The kinds of inefficiencies discussed earlier in the chapter with inadequately or improperly defined property rights also result in operating below the production possibilities curve.

COST

The beauty of an opportunity set like the budget constraint, the time constraint, or the production possibilities curve is that it specifies the cost of one option in term of another. If the individual, the firm, or the society is operating on the constraint or curve, then it is possible to get more of one thing only by sacrificing some of another. The "cost" of one more unit of one good is how much you have to give up of the other.

Economists thus think about cost in terms of trade-offs within opportunity sets. Let's go back to Alfred choosing between CDs and cassettes in Figure 2.1. The trade-off is given by the relative price, the ratio of the prices of CDs and cassettes. In our example, a CD cost \$10, a cassette \$5. The relative price is $\$10 / \$5 = 2$; for every CD Alfred gives up, he can get two cassettes. Likewise, societies and firms face trade-offs along the production possibilities curve, like the one shown in Figure 2.3. There, point A is the choice where 40 million guns and 90 million tons of butter are produced. The trade-off can be calculated comparing points A and B. Society can have 30 million more guns by giving up 20 million tons of butter.

Trade-offs are necessary because resources are scarce. If you want something, you have to pay for it; you have to

give up something. If you want to go to the library tomorrow night, you have to give up going to the movies. If a sawmill wants to make more two-by-four beams from its stock of wood, it will not be able to make as many one-by-four boards.

OPPORTUNITY COSTS

If someone were to ask you right now what it costs to go to a movie, you would probably answer, "Seven dollars," or whatever you paid the last time you went to the movies. But with the concept of trade-offs, you can see that a full answer is not that simple. To begin with, the cost is not the \$7 but what that \$7 could otherwise buy. Furthermore, your time is a scarce resource that must be figured into the calculation. Both the money and the time represent opportunities forgone in favor of going to the movie, or what economists refer to as the **opportunity cost** of the movie. To apply a resource to one use means that it cannot be put to any other use. Thus, we should consider the next-best, alternative use of any resource when we think about putting it to any particular use. This next-best use is the formal measurement of opportunity cost.

Some examples will help to clarify the idea of opportunity cost. Consider a student, Sarah, who enrolls in college. She thinks that the check for tuition and room and board represents the costs of her education. But the economist's mind immediately turns to the job she might have had if she had not enrolled in college. If Sarah could have earned \$15,000 from September to June, this is the opportunity cost of her time, and this forgone income must be added to the college bills in calculating the total cost of the school year.

Now consider a business firm that has bought a building for its headquarters that is bigger than necessary. If the firm could receive \$3 per month in rent for each square foot of space that is not needed, then this is the opportunity cost of leaving the space idle.

The analysis can be applied to the government as well. The federal government owns a vast amount of wilderness. In deciding whether it is worthwhile to convert some of that land into a national park, the government needs to take into account the opportunity cost of the land. The land might be used for growing timber or for grazing sheep. Whatever the value of the land in its next-best use, this is the economic cost of the national park. The fact that the government does not have to buy the land does not mean that the land should be treated as a free good.

Thus, in the economist's view, when rational firms and individuals make decisions — whether to undertake one investment project rather than another, whether to buy one product rather than another — they take into account all of the costs, the full opportunity costs, not just the direct expenditures.

a woman with a college education having a child greater than the opportunity cost of a woman with just a high school education having a child?

7. Bob likes to divide his recreational time between going to movies and listening to compact discs. He has 20 hours a week available for recreation; a movie takes two hours, and a CD takes one hour to listen to. Draw his "time budget constraint." Bob also has a limited amount of income to spend on recreation. He has \$60 a week to spend on recreational activities; a movie costs \$5, and a CD costs \$12. (He never likes to listen to the same CD twice.) Draw his budget constraint. What is his opportunity set?

APPENDIX READING GRAPHS

Whether the old saying that a picture is worth a thousand words under- or overestimates the value of a picture, economists find graphs extremely useful.

For instance, look at Figure 2.5; it is a redrawn version of Figure 2.1, showing the budget constraint—the various combinations of CDs and cassettes he can purchase—of an individual, Alfred. More generally, a graph shows the

relationship between two variables, here, the number of CDs and the number of cassettes that can be purchased. The budget constraint gives the maximum number of cassettes that can be purchased, given the number of CDs that have been bought.

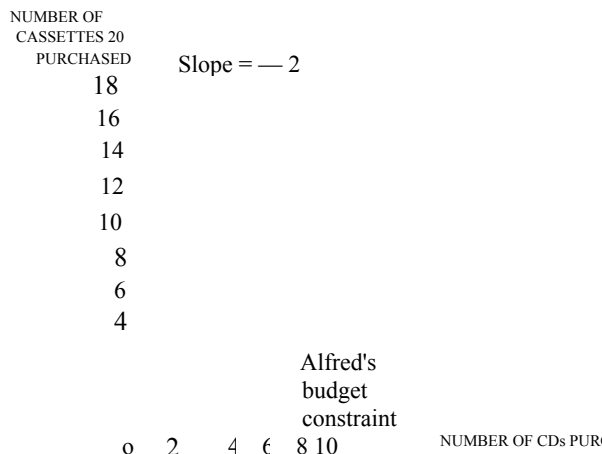
In a graph, one variable (here, CDs) is put on the horizontal axis and the other variable on the vertical axis. We read a point such as *E* by looking down

Figure 2.5 READINGS

GRAPH : THE BUDGET
CONSTRAINT

Graphs can be used to show the relationship between two variables. This one shows the relationship between the variable on the vertical axis (the number of cassettes Alfred can buy) and the variable on the horizontal axis (the number of CDs).

The slope of a curve like the budget constraint gives the change in the number of cassettes that can be purchased as Alfred buys one more CD. The slope of the budget constraint is negative.



A P P E N D I X :

to the horizontal axis and seeing that it corresponds to 4 CDs, and by looking across to the vertical axis and seeing that it corresponds to 12 cassettes. Similarly, we read point A by looking down to the horizontal axis and seeing that it corresponds to 5 CDs, and by looking across to the vertical axis and seeing that it corresponds to 10 cassettes.

In the figure, each of the points from the table has been plotted, and then a curve has been drawn through those points. The "curve" turns out to be a straight line in this case, but we still use the more general term. The advantage of the curve over the individual points is that with it, we can read off from the graph points on the budget constraint that are not in the table.

Sometimes, of course, not every point on the graph is economically meaningful. You cannot buy half a cassette or half a CD. For the most part, we ignore these considerations when drawing our graphs; we simply pretend that any point on the budget constraint is actually possible.

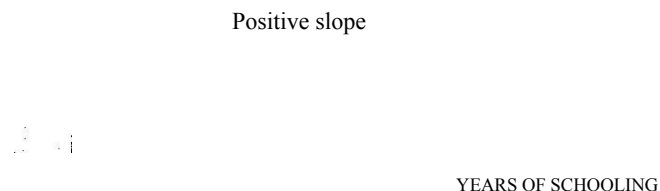


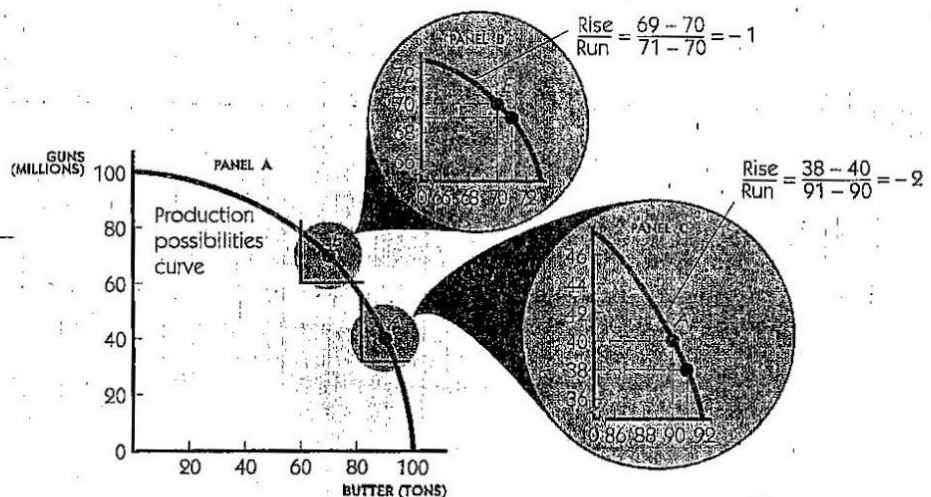
Figure 2.6 P O S I T v E L Y

SLOPED CURVE

Incomes increase with the number of years of schooling.

Figure 2.8 THE GUNS AND BUTTER TRADE-OFF

Panel A shows a trade-off between military spending ("guns") and civilian spending ("butter"), where society chooses point E. Panel B is an enlargement of the area around E, which focuses on the slope there, which also measures the marginal trade-offs society faces near that point. Similarly, panel C is an enlargement of the area around A and shows the marginal trade-offs society faces near that point.



SLOPE

In any diagram; the amount by which the value along the vertical axis increases from a change in a unit along the horizontal axis is called the slope, just like the slope of a mountain. Slope is sometimes described as "rise over run," meaning that the slope of a line can be calculated by dividing the change on the vertical axis (the "rise") by the change on the horizontal axis (the "run").

Look at Figure 2.5. As we move from E to A, increasing the number of CDs by 1, the number of cassettes purchased falls from 12 to 10. For each additional CD bought, the feasible number of cassettes that can be purchased falls by 2. So the slope of the line is $\frac{\text{rise}}{\text{run}} = \frac{10-12}{5-4} = \frac{-2}{1} = -2$

When, as in Figure 2.5, the variable on the vertical axis falls when the variable on the horizontal axis increases, the curve, or line, is said to be negatively sloped. A budget constraint is always negatively sloped. But when we describe the slope of a budget constraint, we frequently omit the term “negative.” We say the slope is 2, knowing that since we are describing the slope of a budget constraint, we should more formally say that the slope is negative 2. Alternatively, we sometimes say that the slope has an absolute value of 2.

Figure 2.6 shows the case of a curve that is positively sloped. The variable along the vertical axis, income, increases as schooling increases, giving the line its upward tilt from left to right.

In later discussions, we will encounter two special cases. A line that is very steep has a very large slope; that is, the increase in the vertical axis for every unit increase in the horizontal axis is very large. The extreme case is a perfectly vertical line, and we say then that the slope is infinite (Figure 2.7, panel A). At the other extreme is a flat, horizontal line; since there is no increase in the vertical axis no matter how large the change along the horizontal, we say that the slope of such a curve is zero (panel B).

Figures 2.5 and 2.6 both show straight lines. Everywhere along the straight line, the slope is the same. This is not true in Figure 2.8, which repeats the production possibilities curve shown originally in Figure 2.3. Panel B of the figure blows up the area around point E. From the figure, you can see that if the output of butter increases by 1 ton, the output of guns decreases by 1 million guns. Thus, the slope is $\frac{\text{rise}}{\text{run}} = \frac{69-70}{71-70} = -1$.

Now look at point A, where the economy is producing more butter. The area around A has been blown up in panel C. Here, we see that when we increase butter by 1 more unit, the reduction in guns is greater than before. The slope at A (again, millions of fewer guns produced per extra ton of butter) is $\frac{\text{rise}}{\text{run}} = \frac{38-40}{91-90} = -2$.

With curves such as the production possibilities curve, the slope differs as we move along the curve.

INTERPRETING CURVES

Look at Figure 2.9. Which of the two curves has a larger slope? The one on the left appears to have a slope that has a larger absolute value. But look carefully at the axes. Notice that in panel A, the vertical axis is stretched relative to panel B. The same distance that represents 20 cassettes in panel B represents only 10 CDs in panel A.

MICROECONOMICS MACROECONOMICS: THE TWO BRANCHES OF ECONOMICS

The detailed study of product, labor, and capital markets is called microeconomics. Microeconomics ("micro" is derived from the Greek word meaning "small") focuses on the behavior of the units — the firms, households, and individuals—that make up the economy. It is concerned with how the individual units make decisions and what effects those decisions. By contrast, macroeconomics ("macro" comes from the Greek word meaning "large") looks at the behavior of the economy as a whole, in particular the behavior of such aggregate measures as overall rates of unemployment, inflation, economic growth, and the balance of trade. The aggregate numbers do not tell us what any firm or household is doing. They tell us what is happening in total, or on average.

It is important to remember that these perspectives are simply two ways of looking at the same thing. Microeconomics is the bottom-up view of the economy; macroeconomics is the top-down view. The behavior of the

economy as a whole is dependent on the behavior of the units that make it up.

The automobile industry is a story of both micro- and macroeconomics. It is a story of microeconomic interactions of individual companies, investors, and labor unions. It is also a story of global macroeconomic forces like oil shortages and economic fluctuations. When auto companies laid off workers in the late 1970s, their problems boosted the overall unemployment rate. The recession of the early 1990s brought heavy reductions in car sales. When the recovery occurred, auto sales grew rapidly.

THE SCIENCE OF ECONOMICS

Economics is a social science. It studies the social problem of choice from a scientific viewpoint, which means that it is built on a systematic exploration of the problem of choice. This systematic exploration involves both the formulation of theories and the examination of data.

A theory consists of a set of assumptions (or hypotheses) and conclusions derived from those assumptions. Theories are logical exercises: if the assumptions are correct, then the results follow. If all college graduates have a better chance of getting jobs and Ellen is a college graduate, then Ellen has a better chance of getting a job than a non graduate. Economists make predictions with their theories. They might use a theory to predict what will happen if a tax is increased or if imports of foreign cars are limited. The predictions of a theory are of the form "If a tax is increased and if the market is competitive, then output will decrease and prices will increase."

In developing their theories, economists use models. To understand how economists use models, consider a modern car manufacturer trying to design a new automobile. It is extremely expensive to construct a new car. Rather than creating a separate, fully developed car for every engineer's or designer's conception of what she would like to see the new car be, the company uses models. The designers might use a plastic model to study the general shape of the vehicle and to assess reactions to the car's aesthetics. The engineers might use a computer model to study the air resistance, from which they can calculate fuel consumption and a separate model for judging the car's comfort.

Just as engineers construct different models to study particular features of a car, so too economists construct models of the economy—in words or equations—to depict particular features of the economy. An economic model might describe a general relationship ("When incomes rise, the number of cars purchased increases"), describe a quantitative relationship ("When incomes rise by 10 percent, the number of cars purchased rises, on average, by 12 percent"), or make a general prediction ("An increase in the tax on gasoline will decrease the demand for cars").

APPENDIX : READING GRAPHS 51

NUMBER OF
CASSETTES 20
PURCHASED

18

16

14

Figure 2.9 SCALING AND

budget

Alfred's

constraint

NUMBER OF

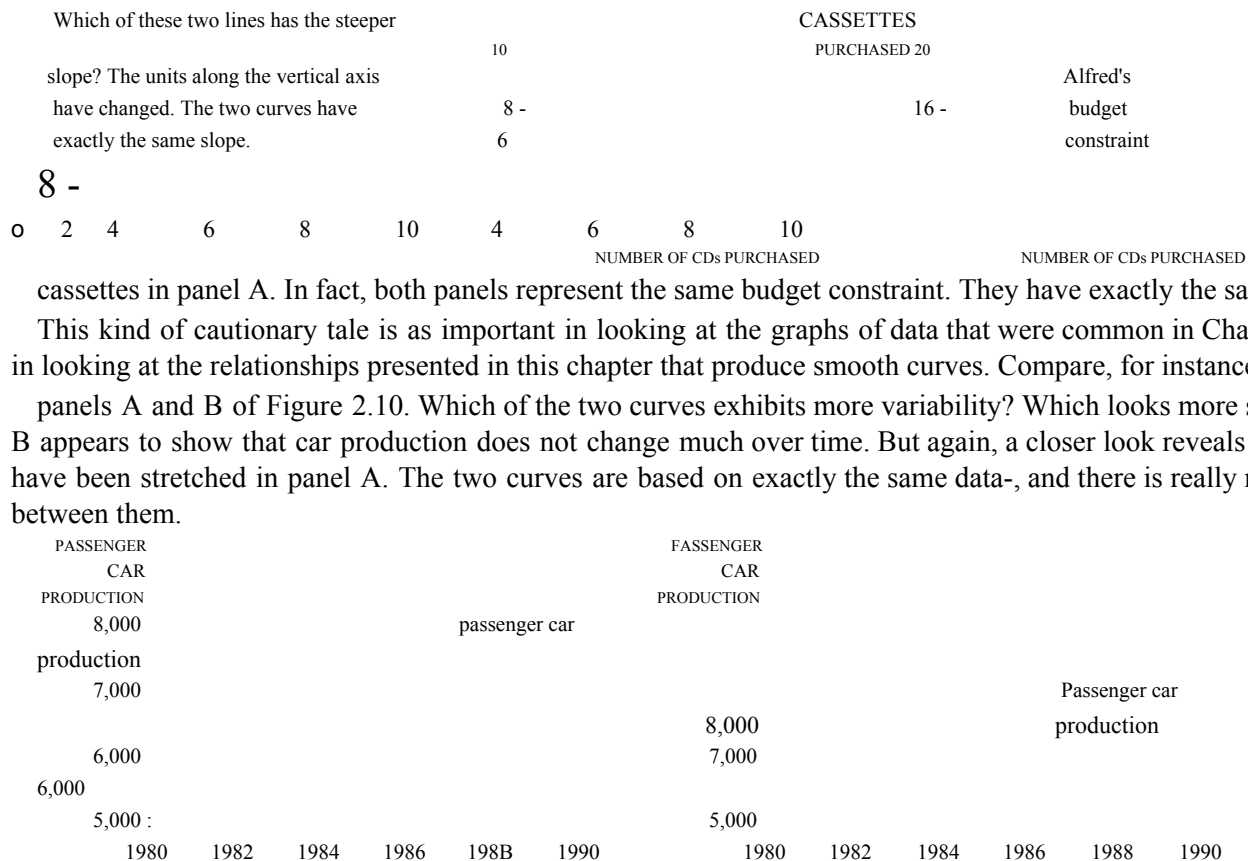


Figure 2.10 S C A L I N G A N D G R A P H S O F D A T A

Which of these two curves shows greater variability in the output of cars over time? The two curves plot the same data. The vertical scale has again been changed. Source: Ward's Automotive Reports (1991)

Session 3

The Benefits of Economic Interdependence

Trade between Countries

Comparative Advantage

TRADE

A creature on another planet looking down at a developed modern economy on earth might compare human activity to an enormous ant colony. Each ant seemingly has an assigned task. Some stand guard. Some feed the young. Some harvest food and others distribute it. Some shuffle paper, scribble notes in books, and type

on computer keyboards at computer consoles. Others work in factories, tightening screws, running machines, and so on. How is all of this activity coordinated? No dictator or superintelligent computer is giving instructions. Yet somehow an immense amount is accomplished in a reasonably coordinated way. Understanding how a complex economy operates—how it is that certain individuals do one task, others do another, how information is communicated and decisions made—is a central objective of economics.

This chapter discusses the problem of economic interdependence at two levels: individuals and firms within a country, and countries within the world economic community. Many of the same principles apply at both levels.

THE BENEFITS OF ECONOMIC INTERDEPENDENCE • 53

KEY QUESTIONS

1. Why is trade (exchange) mutually beneficial? comparative advantage, and why does it play such an important role?
2. What are the similarities and differences between trade (exchange) between individuals within a country and trade between countries?
3. What determines what any particular country produces and sells on the international market? What is meant by
4. What are the gains from specialization?
5. How valid is the argument, so often heard in political circles, that trade should be restricted?

THE BENEFITS OF ECONOMIC INTERDEPENDENCE

We begin by considering the benefits of trade, specifically the exchange of those goods that are already available in the economy.

THE GAIN FROM TRADE

When individuals own different goods, have different desires, or both, there is an opportunity for trades that benefit all parties to the trade. Kids trading baseball cards learn the basic principles of exchange. One has two Ken Griffey, Jr. cards, the other has two Barry Bonds cards. A trade will benefit both of them. The same lesson applies to countries. Nigeria has more oil than it can use, but it does not produce enough food to feed its populace. The United States has more wheat than Americans can consume, but needs oil. Trade can benefit both countries.

Voluntary trade involves only winners. If the Trade would make a loser of any party, that party would choose not to trade. Thus, a fundamental consequence of voluntary exchange is that it benefits everyone involved.

„FEELING JILTED” IN TRADE

In spite of the seemingly persuasive argument that individuals only voluntarily engage in trade if they think they will be better off as a result, people often walk away from a deal believing they have been hurt. It is important to understand that when economists say that a voluntary trade makes the two traders better off, they do not mean that it makes them both happy.

Imagine, for example, that Frank brings an antique rocking chair to a flea market to sell. He is willing to sell it for \$100 but hopes to sell it for \$200. Helen comes to the flea market planning to buy such a chair, hoping to spend only \$100, but willing to pay as much as \$200. They argue and negotiate, eventually settle on a price of \$125, and make the deal. But when they go home, they both complain. Frank complains the price was too low, and Helen that it was too

From an economist's point of view, such complaints are self-contradictory. If Frank really thought \$125 was too

low, he would not have sold at that price. If Helen really thought \$125 was too high, she would not have paid the price. Economists argue that people reveal their preferences not by what they say, but by what they do. If one voluntarily agrees to make a deal, one also agrees that the deal is, if not perfect, at least better than the alternative of not making it.

Two common objections are made to this line of reasoning. Both involve Frank or Helen "taking advantage" of the other. The implication is that if a buyer or a seller can take advantage, then the other party may be a loser rather than a winner.

The first objection is that either Frank or Helen may not really know what is being agreed to. Perhaps Helen recognizes the chair is an antique, but by neglecting to tell Frank, manages to buy it for only \$125. Perhaps Frank knows the rockers fall off, but sells the chair without telling this to Helen, thus keeping the price high. In either case, lack of relevant information makes someone a loser after the trade.

The second objection concerns equitable division of the **gains from trade**. Since Helen would have been willing to pay as much as \$200, anything she pays less than that is **surplus**, the term economists use for a gain from trade. Similarly, since Frank would have been willing to sell the chair for as little as \$100, anything he receives more than that is also surplus. The total dollar value of the gain from trade is \$100—the difference between the maximum price Helen was willing to pay and the minimum price at which Frank was willing to sell. At a price of \$125, \$25 of the gain went to Frank, \$75 to Helen. The second objection is that such a split is not fair.

Economists do not have much patience with these objections. Like most people, they favor making as much information public as possible, and they think vendors and customers should be made to stand behind their promises. But economists also point out that second thoughts and "If only I had known" are not relevant. If Frank sells his antique at a flea market instead of having it valued by reputable antique dealers, he has made a voluntary decision to save his time and energy. If Helen buys an antique at a flea market instead of going to a reputable dealer, she knows she is taking a risk.

The logic of free exchange, however, does not say that everyone must express happiness with the result. It simply says that when people choose to make a deal, they prefer making it to not making it. And if they prefer the deal, they are by definition better off in their own minds at the time the transaction takes place.

The objections to trade nonetheless carry an important message: most exchanges that happen in the real world are considerably more complicated than the Frank-Helen chair trade. They involve problems of information, estimating risks, and expectations about the future. These complications will be discussed throughout the book. So without going into too much detail at the moment, let's just say that if you are worried that you do not have the proper information to make a trade, shop around, get a guarantee or expert opinion, or buy insurance. If you choose to plunge ahead without these precautions, don't pretend you didn't have other choices. Like those who buy a ticket in a lottery, you know you are taking a chance.

ECONOMIC RELATIONS AS EXCHANGES

Individuals in our economy are involved in masses of voluntary trades. They "trade" their labor services (time and skills) to their employer for dollars. They then trade dollars with a multitude of merchants for goods (like gasoline and groceries) and services (like plumbing and hair styling). The employer trades the goods it produces for dollars, and trades those dollars for labor services. Even your savings account can be viewed as a trade: you give the bank \$100 today in exchange for the bank's promise to give you \$105 at the end of the year (your original deposit plus 5 percent interest).

TRADE BETWEEN COUNTRIES

Why is it that people engage in this complex set of economic relations with others? The answer is that people all benefit as a result of trading. Just as individuals within a country find it advantageous to trade with one another, so too do countries find trade advantageous. Just as it is impossible for any individual to be self-sufficient, it is

impossible for a country to be self-reliant without sacrificing its standard of living. The United States has long been part of . an international economic community. This participation has grown in recent decades increasing the interdependence between the United States and its trading partners. How has this affected the three main markets in the U.S. economy?

Interdependence in the Product Market Foreign-produced goods are commonplace in U.S. markets. In the 1990s, for instance, more than a quarter of the cars sold in the United States were **imported** (imports are goods produced abroad but bought domestically), along with a third of apparel items, a third of the oil, and virtually all of the diamonds. Many of the minerals essential for the U.S. economy must also be imported from abroad. At the same time, U.S. farmers **export** almost two-fifths of the agricultural goods they produce (exports are goods produced domestically but sold abroad), including almost three-fourths of the wheat and one-third of the cotton.

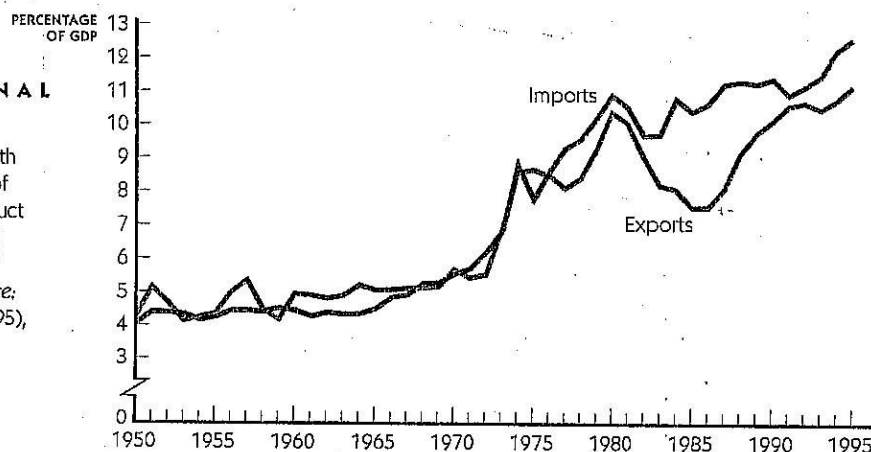
Imports have grown in recent decades, not only in dollars, but also as a percentage of overall production. Exports have grown almost commensurately. Figure 3.1 shows how exports and imports have grown relative to the nation's total output: as a percentage of national output, both have more than doubled over the last twenty-five years. Smaller countries are typically even more dependent on international trade than the United States. Britain and Canada import a quarter of their goods, France a fifth.

Earnings from abroad constitute a major source of income for some of our largest corporations; exports account for 45 percent of sales for Boeing, 20 percent for Hewlett-Packard, and 12 percent for Ford.

Interdependence in the Labor Market International interdependence extends beyond simply the shipping of goods between countries. More than 99 percent of U.S. citizens either immigrated here from abroad or are descended from

Figure 3.1 INTERNATIONAL TRADE

Here, U.S. imports and exports are both expressed as a fraction of a measure of total output, the gross domestic product (GDP). Notice that trade has increased over time, and that imports exceeded exports in the 1980s and 1990s. Source: *Economic Report of the President* (1995), Table B-1.



people who did. Though the flow of immigrants, relative to the size of the population, has slowed since its peak at the turn of the century it is still substantial, numbering in the millions every year. Today many rural American areas are dependent upon foreign-born doctors and nurses. Half of the engineers currently receiving doctorates at American universities are foreign born. The harvests of many crops are highly dependent on migrant laborers from

Mexico.

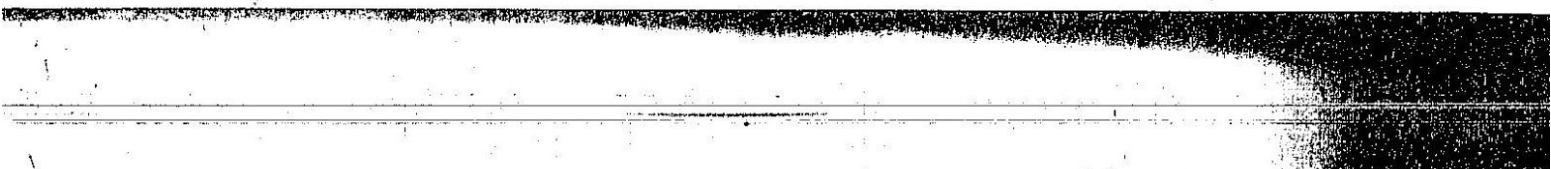
The nations of Europe have increasingly recognized the benefits that result from this international movement of workers. One of the important provisions of the treaty establishing the European Union, an agreement among most of the countries within Western Europe, allows for the free flow of workers within the member countries.

Interdependence in the Capital Market The United States has become a major borrower abroad, but the country also invests heavily overseas. In 1995, for example, U.S. private investors owned approximately \$2.5 trillion of assets (factories, businesses, buildings, loans, etc.) in foreign countries, while foreign investors owned \$2.8 trillion of assets in the United States. American companies have sought out profitable opportunities abroad, where they can use their special skills and knowledge to earn high returns. They have established branches and built factories in Europe, Japan, Latin America, and elsewhere in the world.

Just as the nations of Western Europe have recognized the advantages that follow from the free flow of goods and labor among their countries, so too they have recognized the gains from the free flow of capital. Funds can be invested where they yield the highest returns. Knowledge and skills from one country can be combined with capital from another to produce goods that will be enjoyed by citizens of all countries. Though the process of liberalizing the flow of goods, labor, and capital among countries of the European Union has been going on for more than twenty years, 1992 marked the crucial date at which all remaining barriers were officially removed.

MULTILATERAL TRADE

Many of the examples to this point have emphasized two-way trade. Trade between two individuals or countries is called bilateral trade. But exchanges between two parties is often less advantageous than trade between several parties, called multilateral trade. Such trades are observed between sports teams. The New York Mets send a catcher to the St.



Louis Cardinals, the Cardinals send a pitcher to the Los Angeles Dodgers, and the Dodgers send an outfielder to the Mets (see Figure 3.2A). No two of the teams was willing to make a two-way trade, but all can benefit from the three-way swap.

Countries function in a similar way. Japan has no domestic oil; it imports oil from Arabian countries. The Arabian countries want to sell their oil, but

Figure 3.2 MULTILATERAL EXCHANGE

Panel A shows multilateral, three-way trade between baseball teams. Notice that no two of the teams have the ingredients for a mutually beneficial exchange. Panel B illustrates a multilateral exchange in international trade.

they want wheat and food, not the cars and television sets that Japan can provide. The United States can provide the missing link by buying cars and televisions from Japan and selling food to the Arab nations. Again, this three-way trade, shown in Figure 3.2B, offers gains that two-way trade cannot. The scores of nations active in the world economy

create patterns far more complex than these simplified examples.

Figure 3.3 illustrates the construction of a Ford Escort in Europe, and dramatizes the importance of multilateral and interconnected trade relations. The parts that go into an Escort come from all over the world. Similar diagrams could be constructed for many of the components in the diagram; the aluminum alloys may contain bauxite from Jamaica, the chrome plate may use chromium from South Africa, the copper for wiring may come from Chile.

Multilateral trade means that trade between any two participants may not balance. In Figure 3.2B, the Arab countries send oil to Japan but get no goods (only yen) in return. No one would say that the Arab countries have an unfair trade policy with Japan. Yet some congressional representatives, newspaper

popular cliché says that

each part of the car is made from a different country's product, representing a

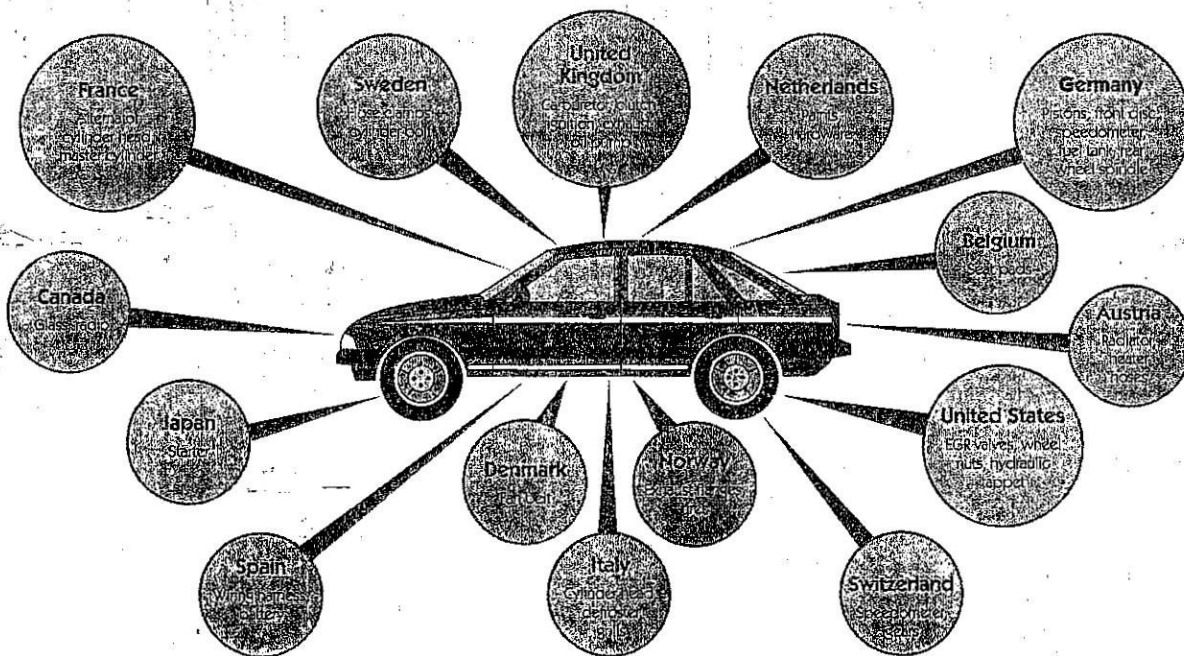


Figure 3.3 THE MAKING OF A MODERN AUTOMOBILE

The ingredients for a Ford Escort are gathered from all over the world. Source: World Development Report(1990).

columnists, and business executives complain that since ports more from a particular country (often Japan) than it exports to that country, the trade balance is "unfair." A misguided popular cliché says that "trade is a two-way street." But trade in the world market involves hundreds of possible streets between nations. While there are legitimate reasons to be concerned with the overall U.S. trade deficit, there is no reason why U.S. exports and imports with any particular country should be balanced.

COMPARATIVE ADVANTAGE

We have so far focused on exchanges of existing goods. But clearly, most of what is exchanged must first be produced. Trade allows individuals and countries to concentrate on what they produce best.

Some countries are more efficient at producing almost all goods than are other countries. The possession of superior production skills is called having an absolute advantage, and these advanced countries are said to have an absolute advantage over the others. How can the countries with disadvantages successfully engage in trade? The answer lies in the principle of comparative advantage, which states that individuals and countries specialize in producing those goods in which they are relatively, not absolutely, more efficient.

To see what comparative advantage means, let's say that both the United States and Japan produce two goods, computers and wheat. The amount of labor needed to produce these goods is shown in Table 3.1. (These numbers are all hypothetical.) The United States is more efficient (spends fewer worker hours) at making both products. America can rightfully claim to have the most efficient computer industry in the world, and yet it imports computers from Japan. Why? The *relative* cost of making a computer (in terms of labor used) in Japan, relative to the cost of producing a ton of wheat, is low, compared with the United States. That is, in Japan, it takes 15 times as many hours (120/8) to produce a computer as a ton of wheat; in the United States, it takes 20 times as many hours (100/5) to produce a computer as a ton of wheat. While Japan has an absolute disadvantage in producing computers, it has a comparative advantage.

Table 3.1 LABOR COST OF PRODUCING COMPUTERS AND WHEAT (worker hourS)

	United State	Japan
Labor required to make a computer	100	120
Labor required to make a ton of wheat	5	8

The principle of comparative advantage applies to individuals as well as countries. The president of a company might type faster than her secretary, but it still pays to have the secretary type her letters, because the president may have a comparative advantage at bringing in new clients, while the secretary has a comparative (though not absolute) advantage at typing.

PRODUCTION POSSIBILITIES SCHEDULES AND COMPARATIVE ADVANTAGE

The easiest way to understand the comparative advantage of different countries is to use the production possibilities schedule first introduced in Chapter 2. Figure 3.4 depicts parts of hypothetical production possibilities schedules for two countries, China and the United States, producing two commodities textiles (garments) and airplanes. In both schedules, point E represents the current level of production. Let us look at what happens if each country changes its production by 100 airplanes.

China has a comparative advantage in producing textiles. If it reduces its airplane production by 100, its textile production can be increased by 10,000 garments. This trade-off between airplanes and garments is called the marginal rate of transformation. By contrast, if the United States reduces its airplane production by 100 airplanes, its

textile production can be increased by only 1,000 garments. Conversely, if it increases its airplane production by 100, it will have to reduce its garment production by only 1,000 garments. We can now see why the world is better off if each country exploits its comparative advantage. If China moves from E to E' (decreasing airplane production by 100) 10,000 more garments can be produced. If the United States at the same time increases its airplane

production by 100 from E to E", it will produce only 1,000 fewer garments. In the new situation, the world production of airplanes is unchanged, but world production of garments has increased by 9,000. So long as the production trade-offs differ — that is, so long as the mar-

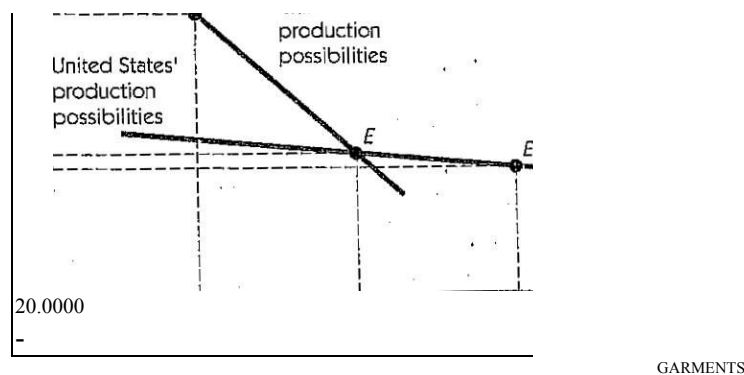


Figure 3.4 EXPLOITING COMPARATIVE ADVANTAGE

The production possibilities schedules for China and the United States, each manufacturing two commodities, textiles 11,000 and airplanes, illustrate the trade-offs at 10,000 9,000 different levels of production. Point E shows the current level of production for each country; E' and E'' illustrate production decisions that better exploit each country's comparative advantage. 100 300

AIRPLANES

USING ECONOMICS CALCULATING THE GAINS FROM TRADE

Problem: Using the earlier example of Japan and the United States producing wheat and computers, calculate the trade-offs and the gains from specialization. Assume that both countries have 240,000 worker hours, initially divided equally between producing wheat and computers.

Solution: First, draw the production possibilities curves, as in the figure below. Since the costs (in worker hours) of producing each unit of each commodity are fixed, the production possibilities schedule is a straight line. If the United States used all its labor to produce computers, it would produce 2,400 computers. If it used all its labor to produce wheat, it would produce 48,000 tons of wheat. If Japan used all its labor to produce computers, it would produce 2,000 computers; if it used all its labor to produce wheat, it would produce 30,000 tons of wheat.

Next, calculate the slope of the production possibilities curve, giving the trade-offs in the United States, increasing wheat output by 1,000 tons leads to a reduction of computers by 50, while reducing wheat output by 1,000 tons from Japan to the United States increases world computer production by $16^{2/3}$.

ginal rates of transformation differ — it pays for China to specialize increasingly in textiles, and the United States to

specialize increasingly in airplanes. Notice that the analysis only requires knowledge about the production trade offs. We do not need to know how much labor or capital is required in either country to produce either airplanes or garments.

Though it pays countries to increase production and export of goods in which they have a comparative advantage and to import goods in which they have a comparative disadvantage, this may not lead to complete specialization. Thus the United States continues to be a major producer of textiles, in spite of heavy imports from the Far East. This does not violate the principle of comparative advantage: not all textiles require the same skill and expertise in manufacturing. Thus, while China may have a comparative advantage in inexpensive textiles, the United States may have a comparative advantage in higher quality textiles. At the same time, the comparative advantage of other countries is so extreme in producing some goods that it does not pay for the United States to produce them at all: TVs, VCRs and a host of other electronic gadgets for example.

COMPARATIVE ADVANTAGE AND SPECIALIZATION

To see the benefits of specialization, consider the pencil. A tree, containing the right kind of wood, must be felled; it must be transported to a sawmill, and there cut into pieces that can be further processed into pencil casings. Then the graphite that runs through the pencil's center, the eraser at its tip, the metal that holds the two together must each be produced by specially trained people. The pencil is a simple tool. But to produce it by oneself would cost a fortune in money and an eternity in time.

Why Specialization Increases Productivity Specialization increases productivity, thus enhancing the benefits of trade, for three reasons. First, specializing avoids the time it takes a worker to switch from one production task to another. Second, by repeating the same task, the worker becomes more skilled at it. And third, specialization creates a fertile environment for invention.

Dividing jobs so that each worker can practice and perfect a particular skill (called the division of labor) may increase productivity hundreds or thousands of times. Almost anyone who practices simple activities—like sewing on a button, shooting a basketball, or adding a column of numbers—will be quite a lot better at them than someone who has not practiced. Similarly, a country that specializes in producing sports cars may develop a comparative advantage in sports cars. With its relatively large scale of production, it can divide tasks into separate assignments for different people; as each becomes better at his own tasks, productivity is increased.

At the same time, the division of labor often leads to invention. As someone learns a particular job extremely well, she figured out ways of doing it better—including inventing a machine to do it. Specialization and invention reinforce each other. A slight initial advantage in some good leads to greater production of that good, thence to more invention, and thence to even greater production and further specialization.

Limits of Specialization The extent of division of labor, or specialization, is limited by the size of the market. There is greater scope for specialization in mass-produced manufactured goods like picture frames than in custom-made items like the artwork that gets framed. That is one reason why the costs of production of mass-produced goods have declined so much. Similarly, there is greater scope for specialization in a big city than a small town. That is why small stores specializing in a particular food or type of clothing thrive in cities but are rare in smaller towns.

The very nature of specialization limits its benefits. Repetitive jobs can lead to bored and unproductive workers. And single-track specialization inhibits the new insights and ideas that can come from engaging in a variety of work activities.

WHAT DETERMINES COMPARATIVE ADVANTAGE ?

Earlier we learned that comparative advantage determines the pattern of trade. But what determines comparative advantage? In the modern world this turns out to be a complex matter.

Natural Endowments In first laying down the principle of comparative advantage in the early 1800s, the great British economist David Ricardo used the example of Portugal's trade with Britain. In Ricardo's example, Portugal had an absolute advantage in producing both wool and wine. But it had a comparative advantage in producing wine, and Britain had a comparative advantage in producing wool. In this and other early examples, economists tended to assume that a nation's comparative advantage was determined largely by its natural endowments. Countries with soil and climate that are relatively better for grapes than for pasture 'Mill produce wine; countries with soil and climate that are relatively better for pasture than for grapes Mill produce sheep (and hence wool).

In the modern economy, natural endowments still count: countries that have an abundance of low-skilled labor relative to other resources, such as China, have a comparative advantage in producing goods like textiles, which require a lot of handwork. But in today's technological age nations can also act to acquire a comparative advantage.

Acquired Endowments Japan has little in the way of natural resources, yet it is a major player in international trade, in part because it has acquired endowments. Japan's case underscores the principle that by saving and accumulating capital and building large factories, a nation can acquire a comparative advantage in goods, like steel, that require large amounts of capital in their production. And by devoting resources to education, a nation can develop a comparative advantage in those goods that require a skilled labor force. Thus, the resources — human and physical — that a country has managed to acquire for itself can also give rise to comparative advantage.

Superior Knowledge In the modern economy, comparative advantage may come simply from expertise in using resources productively. Switzerland has a comparative advantage in watches because, over the years, the people of the country have accumulated superior knowledge and expertise in watchmaking. Belgium has a comparative advantage in fine-lace; its workers have developed the requisite skills. A quirk of fate might have led Belgium to acquire a comparative advantage in watches and Switzerland in lace.

Although patterns of specialization sometimes occur as an accident of history, in modern economies they are more likely to be a consequence of deliberate decisions. The United States' semiconductor industry is a case in point.

CLOSE-UP . THE COMPARATIVE ADVANTAGE OF THE UNITED STATES

What is the U.S. comparative advantage? Looking at the strengths of the United States in comparison with the rest of the world, one thinks of high technology. With over three-fourths of the world living in poor countries, without access even to the capital required for manufacturing, it would seem that these countries would have a comparative advantage in agriculture. Thus agriculture would be an area in which the United States had a comparative disadvantage. This intuitive answer is half right. The United States does export high technology products like computing equipment, aircraft and aircraft engines, industrial organic chemicals, plastics and resins; and pharmaceuticals (drugs). In addition, the United States receives two billion dollars in payments from other countries using its patents.

But the United States is also a major exporter of agricultural goods, dominating world exports of wheat, corn, and cereals. It also exports rice, dairy products, and a host of

other agricultural commodities.* For some commodities, this is a consequence of governmental intervention overruling the workings of the market: the costs of production of dairy products exceeds what is received on the international market, with the taxpayer making up the difference through subsidies to exports. In most cases, however, the United States has a true comparative advantage: American farmers substitute sophisticated knowledge of farming, using skilled labor, advanced seeds, fertilizers, pesticides, and equipment instead of unskilled labor.

*The seemingly paradoxical observation that the United States was exporting less-capital-intensive goods, and importing more-capital-intensive goods, was first noted by Nobel Prize-winning economist Wassily Leontief, in a famous paper written in 1953. It is referred to as the Leontief paradox in his honor.

This industry manufactures the tiny silicon brains that control computers. Semiconductors were invented by an American, Robert Noyce, and in the 1970s, the United States had a powerful comparative advantage in manufacturing semiconductors; but Japan managed to become a close competitor in the 1980s. The rise of the U.S. semiconductor industry was built in part on decisions by the federal government to fund the necessary research (primarily so the semiconductors could be used in guided missiles and other weapons). The rise of the Japanese industry was similarly based on decisions by that government to support its semiconductor industry.

Stories like that of the semiconductor industry have led some economists to argue that government should encourage certain industries, in order for them to gain a technological advantage, for instance, through the support of research relevant to that industry.

Specialization Earlier we saw how comparative advantage leads to specialization. Specialization may also lead to comparative advantage. The Swiss make fine watches, and have a comparative advantage in that market based on years of unique experience. Such superior knowledge, however, does not explain why Britain, Germany, and the United States, which are at roughly the same level of technological expertise in building cars, all trade cars with one another. How can each country have a comparative advantage in making cars? The answer lies in specialization.

Both Britain and Germany may be better off if Britain specializes in producing sports cars and Germany in producing luxury cars, or conversely, because specialization increases productivity. Countries enhance, or simply develop, a comparative advantage by specializing just as individuals do. As a result, similar countries enjoy the advantages of specialization even when they specialize in different variations of basically similar products.

THE FOUR BASES OF COMPARATIVE ADVANTAGE

Natural endowments, which consist of geographical determinants such as land, natural resources, and climate

Acquired endowments, which are the physical capital and human skills a nation has developed

Superior knowledge, including technological advantages, which may be acquired either as an accident of history or through deliberate policies

Specialization, which may create comparative advantages between countries that are similar in all other respects

Session 4

The Role of Price

Demand

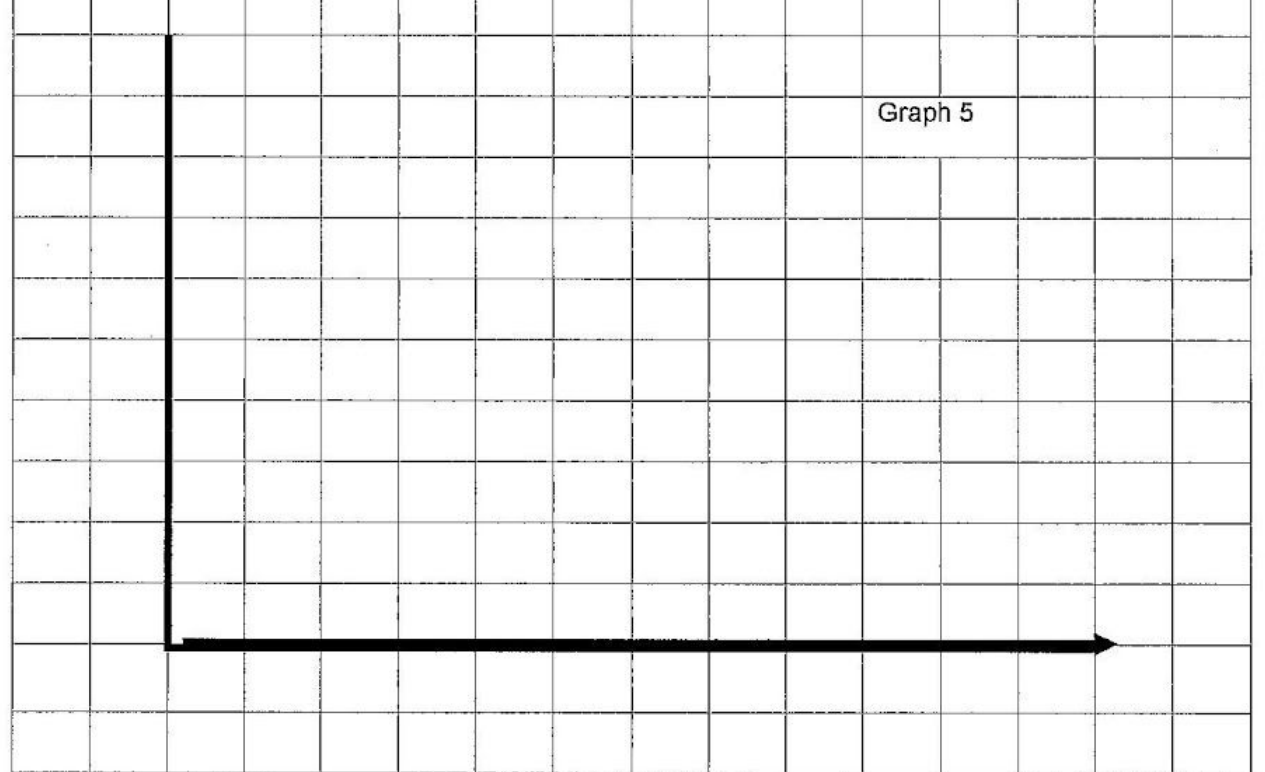
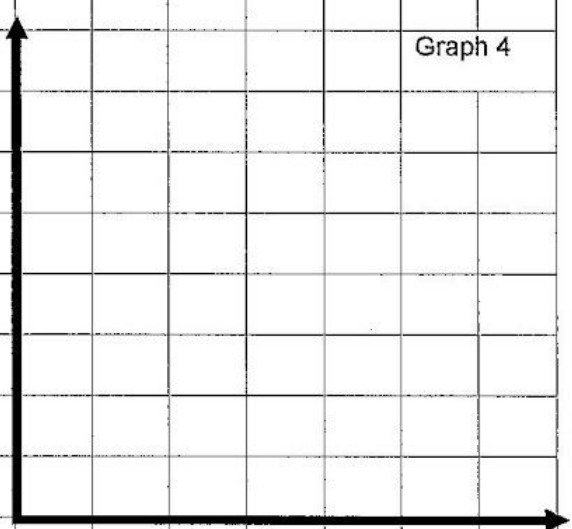
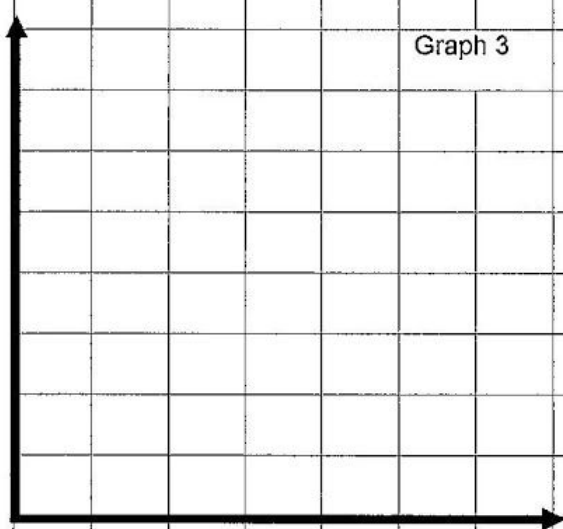
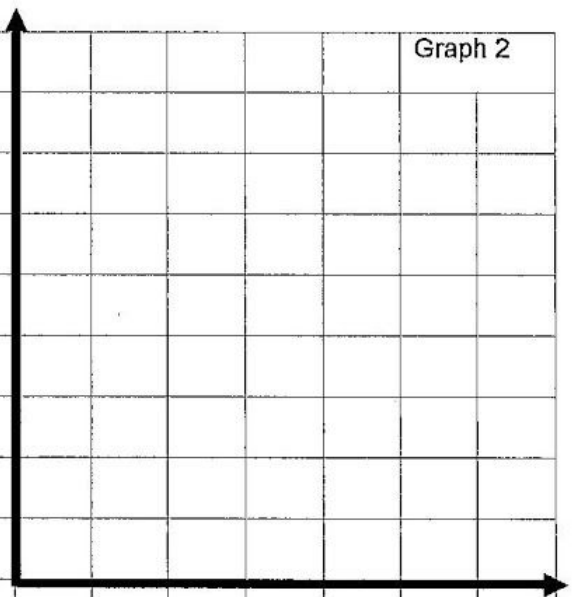
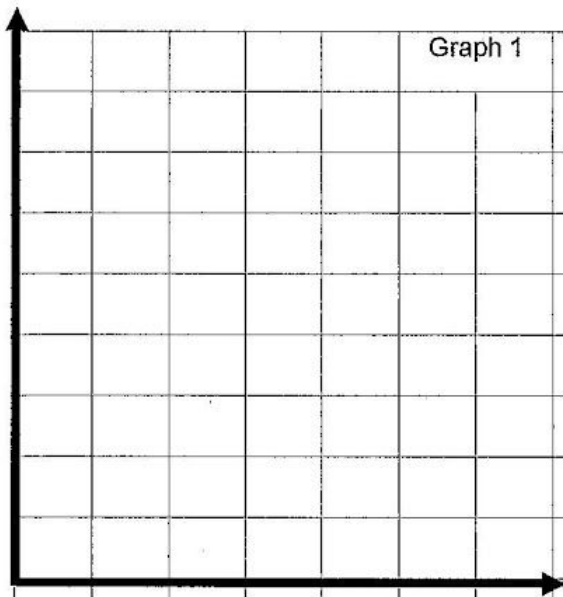
The Individual Demand Curve

The Market Demand Curve

Shifts in Demand Curves

Sources of Shifts in Demand Curves

Shifts Versus Movement in Demand Curves



CHAPTER

4

DEMAND, SUPPLY, AND PRICE

Choice in the face of scarcity, as we have seen, is the fundamental concern of economics. The **price** of a good or service is what must be given in exchange for the good. When the forces of supply and demand operate freely, price measures scarcity. As such, prices convey critical economic information. When the price of a resource used by a firm is high, the company has a greater incentive to economize on its use. When the price of a good that the firm produces is high, the company has a greater incentive to produce more of that good, and its customers have an incentive to economize on its use. In these ways and others, prices provide our economy with incentives to use scarce resources efficiently. This chapter describes how prices are determined in competitive market economies.

KEY QUESTIONS

1. What is meant by demand? Why do demand curves normally slope downward? On what variables, other than price, does the quantity demanded depend?
 2. What is meant by supply? Why do supply curves normally slope upward? On what variables, other than price, does the quantity supplied depend?
 3. Why do economists say that the equilibrium price occurs at the intersection of the demand and supply curves?
 4. How do shifts in the demand and supply curves affect the equilibrium price?
-

THE ROLE OF PRICES

Prices are the way participants in the economy communicate with one another. Assume a drought hits the country, reducing drastically the supply of corn. Households will need to reduce their consumption of corn or there will not be enough to go around. But how will they know this? Suppose newspapers across the country ran an article informing people they would have to eat less corn because of a drought. What incentive would they have to pay attention to it? How would each family know how much it ought to reduce its consumption? As an alternative to the newspaper, consider the effect of an increase in the price of corn. The higher price conveys all the relevant information. It tells families corn is scarce at the same time as it provides incentives for them to consume less of it. Consumers do not need to know anything about why corn is scarce, nor do they need to be told by how much they should reduce their consumption of corn.

Price changes and differences present interesting problems and puzzles. In the early 1980s, while the price of an average house in Los Angeles went up by 41 percent, the price of a house in Milwaukee, Wisconsin, increased by only 4 percent. Why? During the same period, the price of computers fell dramatically, while the price of bread rose, but at a much slower rate than the price of housing in Los Angeles. Why? The "price" of labor is just the wage or salary that is paid. Why does a physician earn three times as much as a college professor, though the college professor may have performed better in the college courses they took together? Why did average wage rates fall in the United States between 1973 and 1983? Why is the price of water, without which we cannot live, very low in most cases, but the price of diamonds, which we can surely live without, very high? The simple answer to all these questions is that in market economies like the United States, price is determined by supply and demand. Changes in prices are determined by changes in supply and demand.

Understanding the causes of changes in prices and being able to predict their occurrence is not just a matter of academic interest. One of the events that precipitated the French Revolution was the rise in the price of bread, for which the people blamed the government. Large price changes have also given rise to recent political turmoil in several countries, including Morocco, the Dominican Republic, Russia and Poland.

Non-Economists see much more in prices than the impersonal forces of supply and demand. It was the landlord who raised the rent on the apartment; it was the oil company or the owner of the gas station who raised the price of gasoline. These people and companies *chose* to raise their prices, says the non-economist, in moral indignation. True, replies the economist, but there must be some factor that made these people and companies believe that a higher price was not a good idea yesterday, but is today. And economists point out that at a different time, these same impersonal forces can force the same landlords and oil companies to cut their prices. Economists see prices, then, as symptoms of underlying causes, and focus on the forces of demand and supply behind price changes.

DEMAND

Economists use the concept of **demand** to describe the quantity of a good or service that a household or firm chooses to buy at a given price. It is important to understand that economists are concerned not just with what people desire, but with what they choose to buy given the spending limits imposed by their budget constraint and given the prices of various goods. In analyzing demand, the first question they ask is how the quantity of a good purchased by an individual changes as the price changes, keeping everything else constant.

THE INDIVIDUAL DEMAND CURVE

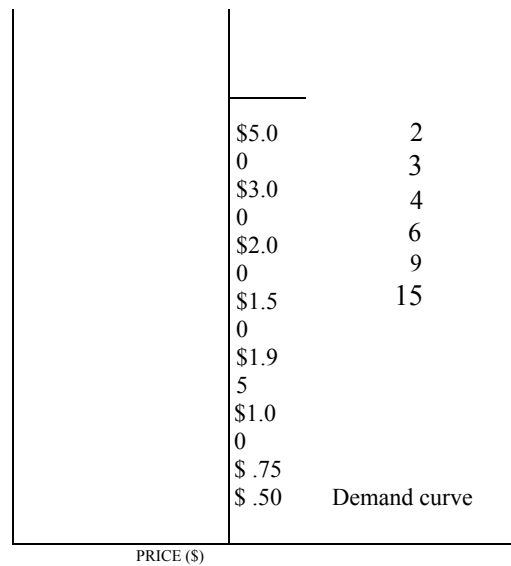
Think about what happens as the price of candy bars changes. At a price of \$5.00, you might never buy one. At \$3.00, you might buy one as a special treat. At \$1.25, you might buy a few, and if the price declined to \$.50, you might buy a lot. The table in Figure 4.1 summarizes the weekly demand of one individual Roger, for candy bars at these different prices. We can see that the lower the price, the larger the quantity demanded. We can also draw a graph that shows the quantity Roger demands at each price. The quantity demanded is measured along the horizontal axis, and the price is measured along the vertical axis. The graph in Figure 4.1 plots the points.

A smooth curve can be drawn to connect the points. This curve is called the demand curve. The demand curve gives the quantity demanded at each price. Thus, if we want to know how many candy bars a week Roger will demand at a price of \$1.00, we simply look along the vertical axis at the price

DEMAND, SUPPLY, AND

PRICE (CH. 4)

Figure 4.1 AN INDIVIDUAL'S DEMAND CURVE



This demand curve shows the quantity of candy bars that Roger consumes at each price. Notice that quantity demanded falls as the price increases, and the demand curve slopes down.

Critical price 5.00

4.00

3.00
2.00
1.50

1.00
50

4. 6 8 10 12 14 16
QUANTITY OF CANDY BARS

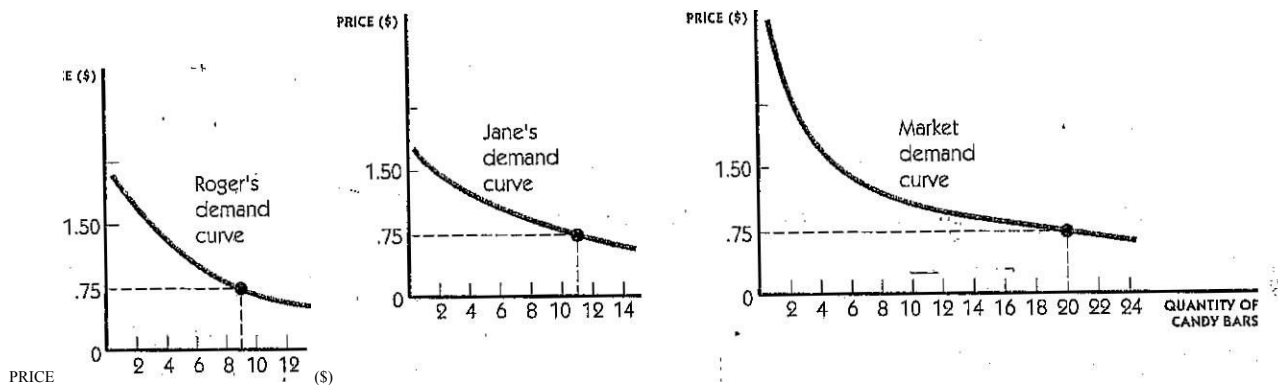
\$1.00, find the corresponding point A along the demand curve, and then read down to the horizontal axis. At a price of \$1.00, Roger buys 6 candy bars each week. Alternatively, if we want to know at what price he will buy just 3 candy bars, we look along the horizontal axis at the quantity 3, find the corresponding point B along the demand curve, and then read across to the vertical axis. Roger will buy 3 candy bars at a price of \$1.50.

As the price of candy bars increases the quantity demanded decreases. This can be seen from the numbers in the table in Figure 4.1, and in the shape of the demand curve, which slopes downward from left to right. This relationship is typical of demand curves and makes common sense: the cheaper a good is (the lower down we look on the vertical axis), the more of it a person will buy (the farther right on the horizontal axis); the more expensive, the less a person will buy.

DEMAND CURVE

The demand curve gives the quantity of the good demanded at each price.

DEMAND 75



THE MARKET DEMAND CURVE

THE MARKET DEMAND CURVE

Suppose there was a simple economy made up of two people, Roger and Jane. Figure 4.2 illustrates how to add up the demand curves of these two individuals to obtain a demand curve for the market as a whole. We "add" the demand curves horizontally by taking, at each price, the quantities demanded by Roger and by Jane and adding the two together. Thus, in the figure, at the price of \$.75, Roger demands 9 candy bars and Jane demands 11, so that the total market demand is 20 candy bars. The same principles apply no matter how many people there are in the economy. **The market demand curve** gives the total quantity of the good that will be demanded at each price. The table in Figure 4.3 summarizes the information for our example of candy bars; it gives the total quantity of candy bars demanded by everybody in the economy at various prices. If we had a table like the one in Figure 4.3 for each person in the economy, we would construct Figure 4.3 by adding up, at each price, the total quantity of candy bars purchased. Figure 4.3 tells us, for instance, that at a price of \$3.00 per candy bar, the total market demand for candy bars is 1 million candy bars, and that lowering the price to \$2.00 increases market demand to 3 million candy bars.

Figure 4.3 also depicts the same information in a graph. As with Figure 4.1, price lies along the vertical axis, but now the horizontal axis measures the quantity demanded by everyone in the economy. Joining the points in the figure together, we get the market demand curve. If we want to know what the total demand for candy bars will be when the price is \$1.50 per candy bar, we look on the vertical axis at the price \$1.50, find the corresponding point A along the demand curve, and read down to the horizontal axis; at that price, total demand is 4 million candy bars. If we want to know what the price of candy bars will be when the demand equals 20 million, we find 20 million along the horizontal axis, look up to find the corresponding point B along the market demand curve, and read across to the vertical axis; the price at which 20 million candy bars are demanded is \$.75.

Notice that just as when the price of candy bars increases, the individual's demand decreases, so too when the price of candy bars increases, market demand decreases. Thus, the market demand curve also slopes downward from left to right. This general rule holds both because each individual's demand curve is downward sloping and because as the price is increased, some individuals decide to stop buying altogether. In Figure 4.1, for example,

Roger exits the market—consumes a quantity of zero—at the price of \$.50, at which his demand curve hits the vertical axis. At successively higher prices more and more individuals exit the market.

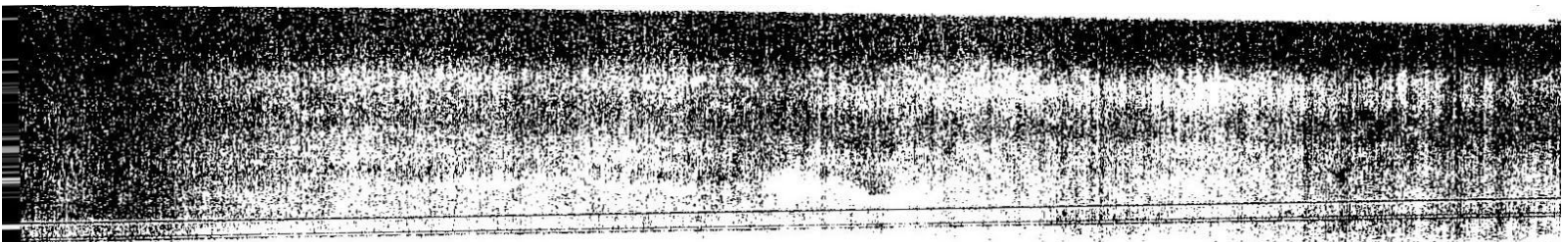
SHIFTS IN DEMAND CURVES

When the price of a good increases, the quantity demand for that good decreases — when everything else is held constant. But in the real world, everything is not held constant. Any changes other than the price of the good in question shift

POLICY PERSPECTIVE: GOOD NEWS IS BAD NEWS

In the second half of 1993 oil prices fell dramatically by nearly 25 percent. For consumers, this was good news, but for the Clinton administration, it presented a problem. In August 1992, the United States had signed the Framework Convention on Climate Change, known as the Rio

convention, committing the country by the year 2000 to reduce its emissions of greenhouse gases to the level they had been in 1990. (Greenhouse gases, such as carbon dioxide, contribute to global warming.) Since the economy in 2000 would be substantially larger than in 1990, there would have



to be corresponding increases in energy efficiency to meet this goal. In September 1993, the United States had outlined an ambitious "National Action Plan" for fulfilling the country's commitments. But the plan was predicated on oil prices remaining the same. Falling oil prices would increase demand. Demand curves of the kind discussed in this chapter

enabled analysts to calculate the increased energy consumption—and greenhouse gas emissions—that could be expected. These calculations indicated that there would be a substantial shortfall in meeting U.S. commitments, unless further steps were taken.

the (whole) demand curve—that is, change the amount that will be demanded at each price. How the demand curve for candy has shifted as Americans have become more weight conscious provides a good example. Figure 4.4 shows hypothetical demand curves for candy bars in 1960 and in 1995. We can see from the figure, for instance, that the demand for candy bars at a price of \$.75 has decreased from 20 million candy bars (point E₁₉₆₀, original equilibrium) to 10 million (point E₁₉₉₅), as people have reduced their "taste" for candy.

78 • DEMAND, SUPPLY, AND PRICE (CH. 4)

Figure 4.4 SHIFTS IN THE DEMAND CURVE

A leftward shift in the demand curve means that a lesser amount will be demanded at every given market price.

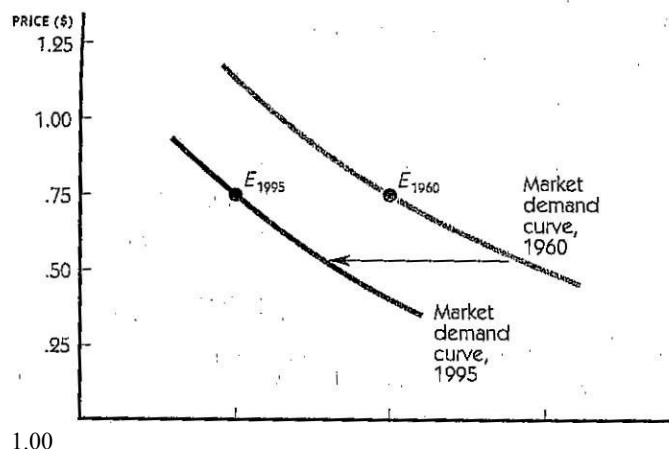


Figure 4.4 SHIFTS IN THE DEMAND CURVE.

A leftward shift in the demand curve means that a lesser amount will be demanded at every given market price.

Figure 4.5 A RIGHT -

WARD SHIFT IN THE DEMAND CURVE

If, at each price, there is an increase in the quantity demanded, then the demand curve will have shifted to the right, as depicted. An increase in income, an increase in the price of a substitute, or a decrease in the price of a complement can cause a rightward shift in the demand curve.

SOURCES OF SHIFTS DEMAND CURVES

Two of the factors that shift the demand curve—changes in income and in the price of other goods—are specifically

economic factors. As an individual's income increases, she normally purchases more of any good. Thus, rising incomes shift the demand curve to the right, as illustrated in Figure 4.5. At each price, she consumes more of the good.

Changes in the price of other goods, particularly closely related goods, will also shift the demand curve for a good. For example, when the price of margarine increases, some individuals will substitute butter. Two goods are substitutes if an increase in the price of one increases the demand for the other. Butter and margarine are thus substitutes. When people choose between butter and margarine, one important factor is the relative price, that is, the ratio of the price of butter to the price of margarine. An increase in the price of butter and a decrease in the price of margarine both increase the relative price of butter. Thus, both induce individuals to substitute margarine for butter.

Candy bars and granola bars can also be considered substitutes, as the two goods satisfy a similar need. Thus, an increase in the price of granola bars makes candy bars relatively more attractive, and hence leads to a rightward shift in the demand curve for candy bars. (At each price, the demand for candy is greater.)

Sometimes, however, an increase in a price of other goods has just the opposite effect. Consider an individual who takes sugar in her coffee. In deciding on how much coffee to demand, she is concerned with the price of a cup of coffee with sugar. If sugar becomes more expensive, she will demand less

CLOSE-UP: GASOLINE PRICES AND DEMAND FOR SMALL CARS

When demands for several products are intertwined, conditions affecting the price of one will affect the demand for the other. When gasoline prices in the United States increased in the 1970s, for example, the change affected the demand for small cars.

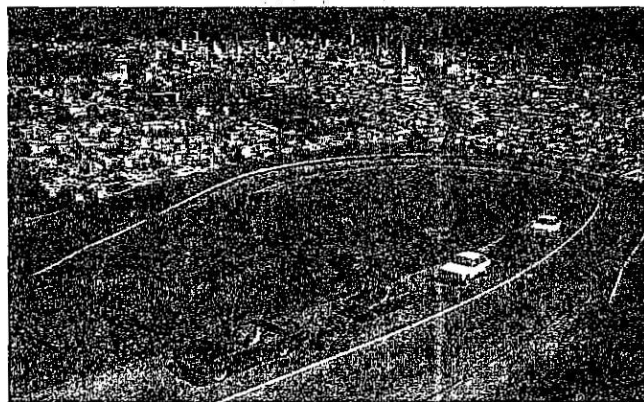
Actually, the price of gasoline soared twice in the 1970s: once when the Organization of Petroleum Exporting Countries (OPEC) shut off the flow of oil to the United States in 1973, and again when the Shah of Iran was driven from power in 1979 leading to a disruption in oil supplies. The price of gasoline at the pump rose from \$.27 a gallon in 1973 to \$1.40 a gallon by 1981. How could Americans conserve on gasoline? The distance from home to office was not going to shrink, and people had to commute to their jobs. One solution found by American drivers was that when the time came to replace their old cars, they purchased smaller cars that offered more miles to the gallon year.

Analysts classify car sales according to car size. Just after the first rise in gas prices, about 2.5 million large cars, 2.8 million compacts, and 2.3 million subcompacts were bought per year. By 1985 the proportions had shifted drastically. About 1.5 million large cars were sold that year, a significant decline from the mid-1970s. The number of subcompacts sold was relatively unchanged at 2.2 million, but the number of compacts sold soared to 3.7 million.

The demand curve for any good (like cars) assumes that the price of complementary goods (like gasoline) is fixed. The rise in gasoline prices caused the demand curve for small cars to shift out to the right and the demand curve for large cars to shift back to the left.

The reason is easy to see. Imagine that you drive 15,000 miles per year. A large car gets 15 miles to the gallon, meaning that you would need to buy 1,000 gallons of gasoline per year, while a small car gets 30 miles to the gallon, meaning that you would only have to buy 500 gallons of gas per year. When the price of gasoline was at its 1981 peak of \$1.40 per gallon, this higher mileage translated into a savings of \$700 per year.

2.8 million compacts, and 2.3 mil-



Sources: Gasoline prices taken from various issues of *Survey of Current Business*; auto sales figures from Linda Williams and Patricia Hu of Oak Ridge National Laboratory; Light Duty Vehicle Summary: Model Year 1976 to the First Half of Model Year 1989.

coffee. For this person, sugar and coffee are complements; an increase in the price of one decreases the demand for the other. A price increase of sugar shifts the demand curve of coffee to the left: at each price, the demand for coffee is less. Similarly a decrease in the price of sugar shifts the demand curve for coffee to the right.

Noneconomic factors can also shift market demand curves. The major ones are changes in tastes and in composition of the population. The candy example shown earlier was a change in taste. Other taste changes over the past decade in the United States include a shift from hard liquor to wine and from fatty meats to low-cholesterol foods. Each of these

taste changes has shifted the whole demand curve of the goods in question.

Population changes that shift demand curves are often related to age. Young families with babies purchase disposable diapers. The demand for new houses and apartments is closely related to the number of new households, which in turn depends on the number of individuals of marriageable age. The U.S. population has been growing older, on average, both because life expectancies are increasing and because birth rates fell somewhat after the baby boom that followed World War II. So there has been a shift in demand away from diapers and new houses. Economists working for particular firms and industries spend considerable energy ascertaining population effects, called **demographic effects**, on the demand for the goods their firms sell.

Sometimes demand curves shift as the result of new information. The shifts in demand for alcohol and meat—and even more so for cigarettes—are related to improved consumer information about health risks.

Changes in the availability of credit also can shift demand curves — for goods like cars and houses that people typically buy with the help of loans. When banks, for example, reduce the money available for consumer loans, the demand curves for cars and houses shift.

SOURCES SHIFTS IN MARKET DEMAND CURVES

- A change in income
- A change in the price of a substitute
- A change in the price of a complement
- A change in the composition of the population
- A change in tastes
- A change in information
- A change in the availability of credit
- A change in expectations

DEMAND 81

Finally what people think will happen in the future can shift demand curves. If people think they may become unemployed, they will reduce their spending. In this case, economists say that their demand curve depends on expectations.

SHIFTS IN A DEMAND CURVE VERSUS MOVEMENTS ALONG A DEMAND CURVE

The distinction between changes that result from a shift in the demand curve and changes that result from a movement along the demand curve is crucial to understanding economics. A movement along a demand curve is simply the change in the quantity demanded as the price changes. Figure 4.6A illustrates a movement along the demand curve from point A to point B; given a demand curve, at lower prices, more is consumed. Figure 4.6B illustrates a shift in the demand curve to the right; at a given price, more is consumed. Quantity again increases from Q_0 to Q_1 but now the price stays the same.

In practice, both effects are often present. Thus, in panel c of Figure 4.6, the movement from point A to point C—where the quantity demanded has been

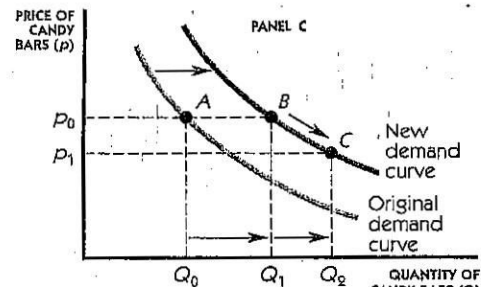
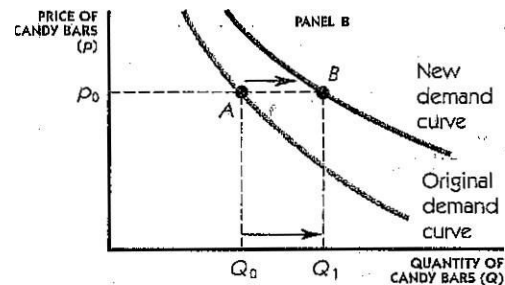
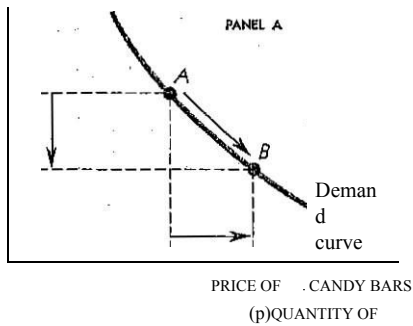


Figure 4.6 MOVEMENT ALONG THE DEMAND CURVE VERSUS SHIFT IN THE DEMAND CURVE

Panel A shows an increase in quantity demanded caused by a lower price—a movement along a given demand curve. Panel B illustrates an increase in quantity demanded caused by a shift in the entire demand curve, so that a greater quantity is demanded at every market price. Panel C shows a combination of a shift in the demand curve (the movement from point A to B) and a movement along the demand curve (the movement from B to C).

Quantity of CANDY BARS (Q)

Session 5

Supply

Market Supply

Shifts in Supply Curves

Law of Supply and Demand

Using Demand and Supply Curves

Price, Value, and Cost

o DEMAND, SUPPLY, AND PRICE (CH. 4)

increased from (20 to Q_z —consists of two parts: a change in quantity demanded resulting from a shift in the demand curve (the increase in quantity from Q_0 to Q_1), and a movement along the demand curve due to a change in the price (the increase in quantity from Q_1 to Q_2).

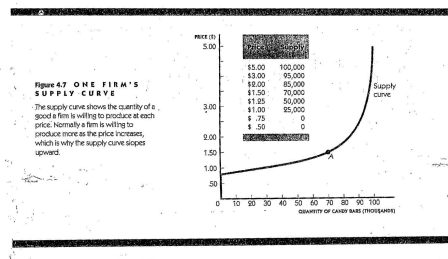
SUPPLY

Economists use the concept of supply to describe the quantity of a good or service that a household or firm would like to sell at a particular price. Supply in economics refers to such seemingly disparate choices as the number of candy bars a firm wants to sell and the number of hours a worker is willing to work. As with demand, the first question economists ask is how does the quantity supplied change when price changes, keeping everything else the same?

Figure 4.7 shows the number of candy bars that the Melt-in-the-Mouth Chocolate Company would like to sell, or supply to the market, at each price. As the price rises, so does the quantity supplied. Below \$1.00, the firm finds it unprofitable to produce. At \$2.00, it would like to sell 85,000 candy bars. At \$5.00, it would like to sell 100,000.

Figure 4.7 also depicts these points in a graph. The curve drawn by connecting the

8



points is called the supply curve.

It shows the quantity that Melt-in-the-Mouth will supply at each price, holding all other factors constant. As with the demand curve, we put the price on the vertical axis and the quantity supplied on the horizontal axis. Thus, we can read point A on the curve as indicating that at a price of \$1.50 the firm would like to supply 70,000 candy bars.

In direct contrast to the demand curve, the typical supply curve slopes upward from left to right; at higher prices, firms will supply more. ¹ This is because higher prices yield suppliers higher profits—giving them an incentive to produce more.

SUPPLY CURVE

The supply curve gives the quantity of the good supplied at each price.

MARKET SUPPLY

The market supply of a good is simply the total quantity that all the firms in the economy are willing to supply at a given price. Similarly, the market supply of labor is simply the total quantity of labor that all the households in the economy are willing to supply at a given wage. Figure 4.8 tells us, for instance, that at a price of \$2.00, firms will supply 70 million candy bars, while at a price of \$.50, they will supply only 5 million.

Figure 4.8 also shows the same information graphically. The curve ^{verbindet} joining the points in the figure is the market supply curve. The market supply curve gives the total quantity of a good that ^{firms} ~~firms~~ are willing to produce at each price. Thus, we read point' A on the market supply curve as showing that at a price of \$.75, the firms in the economy would like to sell 20 million candy bars.

As the price of candy bars increases, the quantity supplied increases, other things equal. The market supply curve slopes upward from left to right for two reasons: at higher prices, each firm in the market is willing to produce more; and at higher prices, more firms are willing to enter the market to produce the good.

The market supply curve is calculated from the supply curves of the different firms in the same way that the market demand curve is calculated from the demand curves' of the different households: at each price, we add horizontally the quantities that each of the firms is willing to produce.

¹ Chapter 9 will describe some unusual situations where supply curves may not be upward sloping.

Figure 4.9 THE MARKET SUPPLY CURVE

The market supply curve shows the quantity of a good all firms in market are willing to supply at each price. The market supply curve is normally upward sloping, both because each firm is willing to supply more of the good at a higher price and because higher prices entice new firms to produce.

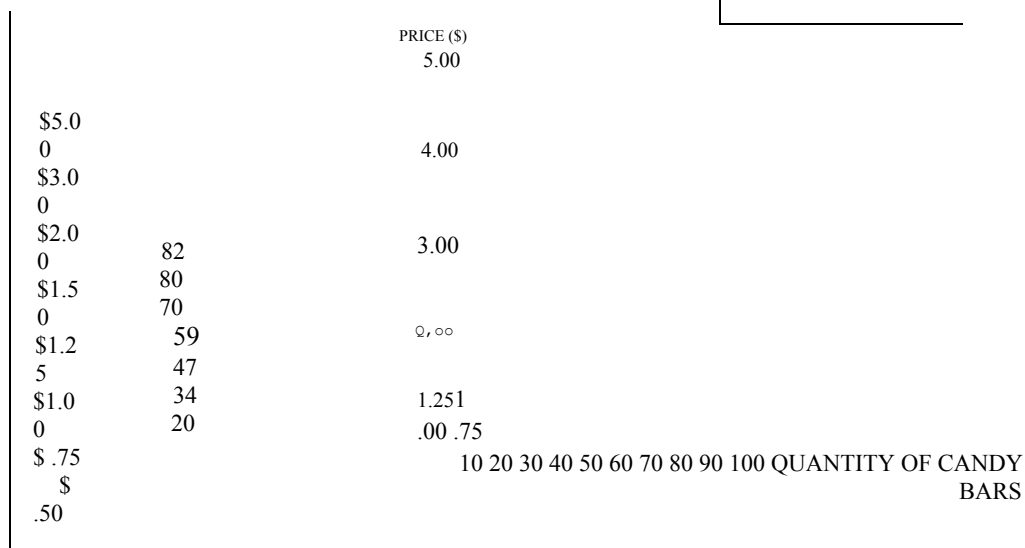


Figure 4.9 shows how this is done in a market with only two producers. At a price of \$1.25, Melt-in-the-Mouth Chocolate produces 50,000 candy bars, while the Chocolates of Choice Company produces 40,000. So the market supply is 90,000 bars. The same principle applies to markets with many firms.

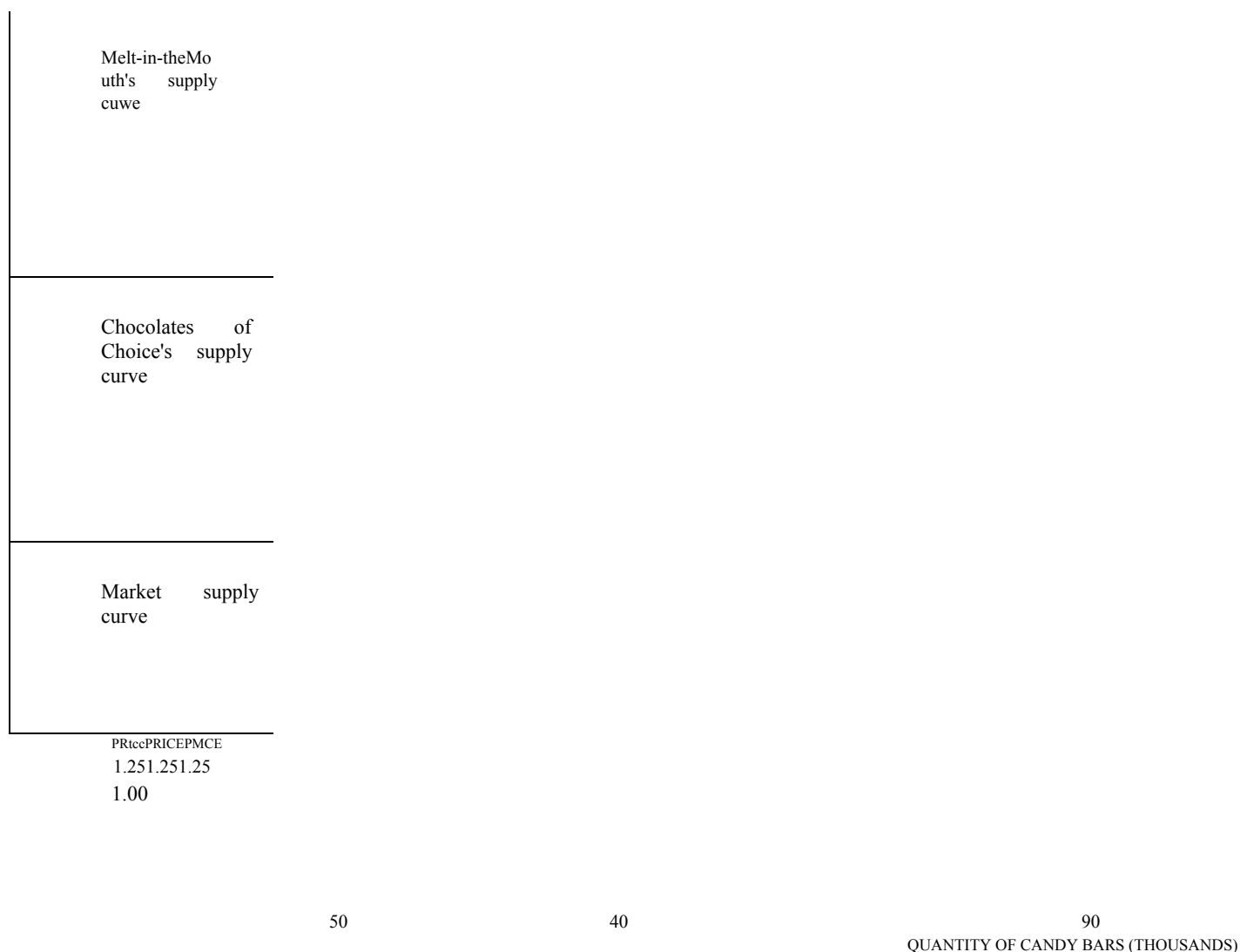


Figure 4.9 DERIVING THE MARKET SUPPLY CURVE

The market supply curve is constructed by adding up the quantity that each of the firms in the economy is willing to supply at each price. The figure here shows what market supply would be if there were only two producers. Actual market supply, as depicted in Figure 4.8, is much larger because there are many producers.

Figure 4.10 SHIFTING THE SUPPLY CURVE TO THE LEFT

A drought or other disaster (among other possible factors) will cause the supply curve to shift to the left, so that at each price a smaller quantity is supplied.

SHIFTS IN SUPPLY CURVES

Just as demand curves can shift, supply curves too can shift, so that the quantity supplied at each price increases or decreases. Suppose a drought hits the breadbasket states of mid-America. Figure 4.10 illustrates the situation. The supply curve for wheat shifts to the left, which means that at each price of wheat, the quantity firms are willing to supply is smaller.

SOURCES OF SHIFT IN SUPPLY CURVES

There are several sources of shifts in market supply curves, just as in the case of the market demand curves already discussed. One is changing prices of the inputs used to produce a good. Figure 4.11 shows that as corn becomes less expensive, the supply curve for cornflakes shifts to the right. Producing corn flakes costs less, so at every price, firms are willing to supply a greater quantity. That is why the quantity supplied along the curve S_1 is greater than the quantity supplied, at the same price, along the curve S_0 .

Another source of shifts is changes in technology. The technological improvements in the computer industry over the past two decades have led to a rightward shift in the market supply curve. Yet another source of shifts is nature. The supply curve for agricultural goods may shift to the right or left depending on weather conditions, insect infestations, or animal diseases.

Pre Drought supply curve

QUANTITY OF WHEAT (Q)

Cornflake supply curves

QUANTITY OF CORN FLAKES

Figure 4.11 SHIFTING THE SUPPLY CURVE THE RIGHT

An improvement in technology or a reduction in input prices (among other possible factors) will cause the supply curve to shift to the right, so that at each price, a larger quantity is supplied.

USING ECONOMICS: PREDICTING THE EFFECTS OF THE DROUGHT OF 1988

For the midwestern United States, 1988 brought one of the worst droughts ever recorded. Corn production was 35 percent lower than had been expected before the drought; soybean production was down more than 20 percent; wheat was down more than 10 percent; and oats and barley were also down. Economists attempted to predict their consequences, using the basic laws of supply and demand that we have developed in this chapter.

The drought reduced the amount of any crop that would be supplied at any given price. The drought can be viewed as shifting the supply curve to the left. Predictably, with a given demand curve, the large shift of the supply curve resulted in much higher prices for these farm products: corn prices rose by 80 percent by the end of the summer, soybeans by almost 70 percent, and wheat by 50 percent.

Economists also used the supply and demand models to predict the effects on other products. Grain is a major input into cattle production. With cattle production less profitable, many farmers slaughtered their cattle sooner than they had originally planned. As a result, meat production rose slightly in 1988. The increased short-run supply resulted in a decrease in meat prices (adjusted for inflation). Grain is also a major input for the production of chicken. The supply curves for chickens and eggs shifted to the left, resulting in higher prices for these commodities. The higher prices of these agricultural goods resulted in a shift to the right of the demand curve for other foods which were substitutes. Thus, prices for foods, such as vegetables and fruits, whose supply was not affected by the midwestern drought, still increased by 5 percent in July 1988 alone.

Reduction in the availability of credit may curtail firms' ability to borrow to obtain inputs needed for production, and this too will induce a leftward shift in the supply curve. Finally, changed expectations can also lead to a shift in the supply curve. If firms believe that a new technology for making cars will become available in two years' time, this belief will discourage investment today and will lead to a temporary leftward shift in the supply curve.

SOURCES OF SHIFTS MARKET SUPPLY CURVES

- A change in the prices of inputs
- A change in technology
- A change in the natural environment
- A change in the availability of credit
- A change in expectations

PRICE OF
Figure 4.12 MOVEMENT CANDY
*ALONG THE SUPPLY BARS (p)
CURVE VERSUS SHIFT
IN THE SUPPLY CURVE

Panel A shows an increased quantity supplied caused by a higher price—a movement along a given supply curve. panel B illustrates an increase in quantity supplied caused by a Shift in the entire supply curve, so that a greater quantity is supplied at every market price.

SHIFTS IN A SUPPLY CURVE VERSUS MOVEMENTS ALONG A SUPPLY CURVE

Distinguishing between a movement along a curve and a shift in the curve itself is just as important for supply curves as it is for demand curves. In Figure 4.12A, the price of candy bars has gone up, with a corresponding increase in quantity supplied. Thus, there has been a movement along the supply curve.

By contrast, in Figure 4.12B, the supply curve has shifted to the right, perhaps because a new production technique has made it cheaper to produce candy bars. Now, even though the price does not change, the quantity supplied increases. The quantity supplied in the market can increase either because the price of the good has increased, so that for a given supply curve, the quantity produced is higher; or because the supply curve has shifted, so that at a given price, the quantity supplied has increased.

LAW OF SUPPLY AND DEMAND

This chapter began with the assertion that supply and demand work together to determine the market price in competitive markets. Figure 4.13 puts a market supply curve and a market demand curve on the same graph to show how this happens. The price actually paid and received in the market will be determined by the intersection of the two curves. This point is labeled E_0 , for equilibrium, and the corresponding price (\$.75) and quantity (20 million) are called, respectively, the equilibrium price and the equilibrium quantity.

Since the term equilibrium will recur throughout the book, it is important to understand the concept clearly. Equilibrium describes a situation where there are no forces (reasons) for change. No one has an incentive to change the result—the price or quantity consumed or produced in the case of supply and demand.

Physicists also speak of equilibrium in describing a weight hanging from a spring. Two forces are working on the weight. Gravity is pulling it down; the spring is pulling it up. When the weight is at rest, it is in equilibrium, with the two forces just offsetting each other. If one pulls the weight down a little bit, the force of the spring will be greater than the force of gravity and the weight will spring up. In the absence of any further intrusions, the weight will bob back and forth and eventually reach its equilibrium position.

An economic equilibrium is established in the same way. At the equilibrium price, consumers get precisely the quantity of the good they are willing to buy at that price, and producers sell precisely the quantity they are willing to sell at that price. Neither producers nor consumers have any incentive to change.

But consider the price of \$1.00 in Figure 4.13. There is no equilibrium quantity here. First find \$1.00 on the vertical axis. Now look across to find point A on the supply curve, and read down to the horizontal axis; point A tells you that at a price of \$1.00, firms want to supply 34 million candy bars. Now look at point B on the demand curve. Point B shows that at a price of \$1.00, consumers only want to buy 13 million candy bars. Like the weight bobbing on a spring however, this market will work its way back to equilibrium, in the following way. At a price of \$1.00, there is excess supply. As producers discover that they cannot sell as much as they would like at this price, some of them will lower their prices slightly, hoping to take business from other producers. When one producer lowers prices, his competitors will have to respond, for fear that they will end up unable to sell their goods. As prices come

Every economic model, including the model of how supply and demand determine the equilibrium price and quantity in a market, is constructed of three kinds of relationships: identities, behavioral relationships, and equilibrium relationships. Recognizing these component parts will help in understanding not only how economists think but also the source of their disagreements.

The market demand is equal to the sum of individual demands. This is an identity. An identity is a statement that is true simply because of the definition of the terms. In other words, market demand is defined to be the sum of the demands of all individuals. Similarly, it is an identity that market supply is equal to the sum of the supplies of all firms; the terms are defined in that way.

The demand curve represents a relationship between the price and the quantity demanded. Normally, as prices rise, the quantity of a good demanded decreases. This is a description of how individuals behave, and is called a behavioral relationship. The supply curve for each firm is also a behavioral relationship. Economists may disagree over behavioral relationships. They may agree about the direction of the relationship but disagree about the strength of the connection. For any given product, does a change in price lead to a large change in the quantity demanded or a small one? But they may even disagree over the direction of the effect. As later chapters will discuss, in some special cases a higher price may actually lead to a lower quantity supplied.

Finally, an equilibrium relationship exists when there are no forces for change. In the supply and demand model, the equilibrium occurs when the quantity demanded is equal to the quantity supplied. An equilibrium relationship is not the same as an identity. It is possible for the economy to be out of equilibrium, at least for a time. Of course, being out of equilibrium implies that there are forces for change pushing toward equilibrium. But an identity must always hold true at all times, as a matter of definition.

Economists usually agree about what an equilibrium would look like, but they often differ on whether the forces pushing the markets toward equilibrium are strong or weak, and thus on whether the economy is typically close to equilibrium or may stray rather far from it.

down, consumers will also buy more, and so on until the market reaches the equilibrium price and quantity.

Similarly assume that the price is lower than \$.75, say \$.50. At the lower price, there is excess demand: individuals want to buy 30 million candy bars (point C), while firms only want to produce 5 million (point D). Consumers unable to purchase all they want will offer to pay a bit more; other consumers, afraid of having to do without, will match these higher bids or raise them. As prices start to increase, suppliers will also have a greater incentive to produce more. Again the market will tend toward the equilibrium point.

To repeat for emphasis: at equilibrium, no purchaser and no supplier has an incentive to change the price or quantity. In competitive market economies actual prices tend to be the equilibrium prices, at which demand equals

supply.

This is called the **law of supply and demand**. Note: this law does not mean that at every moment of time the price is precisely at the intersection of the demand and supply curves. As with the example of the weight and the spring, the market may bounce around a little bit when it is in the process of adjusting. What the law of supply and demand does say is that when a market is out of equilibrium, there are predictable forces for change.

USING DEMAND AND SUPPLY CURVES

The concepts of demand and supply curves—and market equilibrium as the intersection of demand and supply curves—constitute the economist's basic model of demand and supply. This model has proven to be extremely useful. It helps explain why the price of some commodity is high, and that of some other commodity is low. It also helps predict the consequences of certain changes. Its predictions can then be tested against what actually happens.

One of the reasons that the model is so useful is that it gives reasonably accurate predictions.

Figure 4.14 repeats the demand and supply curve for candy bars. Assume, now, however, that sugar becomes more expensive. As a result, at each price, the amount of candy firms are willing to supply is reduced. The supply curve shifts to the left, as in panel A. There will be a new equilibrium, at a higher price and a lower quantity of candy consumed.

Alternatively, assume that Americans become more health conscious, and as a result, at each price fewer candy bars are consumed: the demand curve shifts to the left, as shown in panel B. Again, there will be a new equilibrium, at a lower price and a lower quantity of candy consumed.

This illustrates how changes in observed prices can be related either to shifts in the demand curve or shifts in the supply curve. When the war in Kuwait interrupted the supply of oil from the Middle East in 1990, that was a shift in the supply curve. The model predicted the result: an increase in the price of oil. This increase was the natural process of the law of supply and demand.

DEMAND AND SUPPLY CURVES TO PREDICT PRICE CHANGES

Initially the market for candy bars is in equilibrium at E_0 . An increase in the cost of sugar shifts the supply curve to the left, as shown in panel A. At the new equilibrium, E_1 , the price is higher and the quantity consumed is lower. A shift in taste away from candy results in a leftward shift in the demand curve as shown in panel B. At the new equilibrium, E_1 , the price and the quantity consumed is lower.

CONSENSUS ON THE DETERMINATION OF PRICES

The law of supply and demand plays such a prominent role in economics that there is a joke about teaching a parrot to be an economist simply by leaching it to say "supply and demand." That prices are determined by the law of supply and demand is one of the most long-standing and widely accepted ideas of economists. It forms our fourth point of consensus.

4 Prices

In competitive markets, prices are determined by the law of supply and demand. Shifts in the demand and supply curves lead to changes in the equilibrium price. Similar principles apply to the labor and capital markets. The price for labor is the wage, and the price for capital is the interest rate.

PRICE , VALUE , AND COST

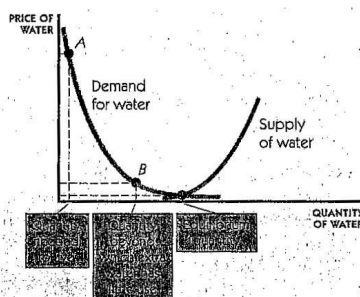
Price, to an economist, is what is given in exchange for a good or service. Price, in this sense, is determined by the forces of supply and demand. Adam Smith, often thought of as the founder of modern economics, called our notion of price "value in exchange," and contrasted it to the notion of "value in use":

The things which have the greatest value in use have frequently little or no value in exchange; and, on the contrary, those which have the greatest value in exchange have frequently little or no value in use. Nothing is more useful than water, but it will purchase scarce any thing; scarce any thing can be had in exchange for it. A diamond, on the contrary, has scarce any value in use; but a very great quantity of other goods may frequently be had in exchange for it.²

The law of supply and demand can help to explain the diamond-water paradox, and many similar examples where "value in use" is very different from "value in exchange." Figure 4.15 presents a demand and a supply curve for water. Individuals are willing to pay a high price for the water they need to live, as illustrated by point A, on the demand curve. But above some quantity, B, people will pay almost nothing more for additional water. In most of the

Figure 4.15 SUPPLY AND DEMAND FOR WATER

Point A shows that people are willing to pay a relatively high price for the first few units of water. But to the right of B, people have plenty of water already and are not willing to pay much for an additional amount. The price of water will be determined at the point where the supply curve crosses the demand curve. In most cases, the resulting price is extremely low.



92 • PRICE 4)

inhabited parts of the world, water is readily available, so it gets supplied in plentiful quantities at low prices. Thus, the supply curve of water intersects the demand curve to the right of B, as in the figure; hence the low equilibrium price. Of course, in the desert, the water supply may be very limited and the price, as a result, very high.

To an economist, the statements that the price of diamonds is high and the price of water is low are statements about supply and demand conditions. They say nothing about whether diamonds are "more important" or "better" than water. In Adam Smith's terms, they are not statements about value in use.

Price is related to the marginal value of an object, that is, the value of an additional unit of the object. Water has a low price not because the total value of water is low — it is obviously high, since we could not live without it — but because the marginal value, what we would be willing to pay to be able to drink one more glass of water a year, is low.

Just as economists take care to distinguish the words "price" and "value," they also distinguish the price of an object (what it sells for) from its cost (the expense of making the object). This is another crucial distinction in economics. The costs of producing a good affect the price at which firms are willing to supply that good. An increase in the costs of production will normally cause prices to rise. And in the competitive model, in *equilibrium*, the price of an object will normally equal its (marginal) cost of production (including the amount needed to pay a firm's owner to

² The Wealth of Nations (1776), Book I, Chapter IV.

stay in buSiness rather than seek some other form of employment). But there are important cases — as we shall see in later chapters — where price does not equal cost.

In thinking about the relationship of price and cost, it is interesting to consider the case of a good in fixed supply, such as land. Normally, land is something that cannot be produced, so its cost of production can be considered infinite (though there are situations where land can be produced, as when Chicago filled in part of Lake Michigan to expand its lake shore). Yet there is still an equilibrium price of land—where the demand for land is equal to its (fixed) supply.

SUMMARY

1. An **individual's demand curve** gives the quantity demanded of a good at each possible price. It normally slopes down, which means that the person demands a greater quantity of the good at lower prices and a lesser quantity at higher prices.
2. The **market demand curve** gives the total quantity of a good demanded by all individuals in an economy at each price. As the price rises, demand falls, both because each person demands less of the good and because some people exit the market.
3. A firm's supply curve gives the amount of a good the firm is willing to supply at each price. It is normally upward sloping, which means that firms supply a greater quantity of the good at higher prices and a lesser quantity at lower prices.
4. The market supply curve gives the total quantity of a good that all firms in the economy are willing to produce at each price. As the price rises, supply rises, both because each firm supplies more of the good and because some additional firms enter the market.
5. The law of supply and demand says that in competitive markets, the equilibrium price is that price at which quantity demanded equals quantity supplied. It is represented on a graph by the intersection of the demand and supply curves.
6. A demand curve only shows the relationship between quantity demanded and price. Changes in tastes, in demographic factors, in income, in the prices of other goods, in information, in the availability of credit, or in expectations are reflected in a shift of the entire demand curve.
7. A supply curve only shows the relationship between quantity supplied and price. Changes in factors such as technology, the prices of inputs, the natural environment, expectations, or the availability of credit are reflected in a shift of the entire supply curve.
8. It is important to distinguish movements along a demand curve from shifts in the demand curve, and movements along a supply curve from shifts in the supply curve.

Session 6

The Basic Competitive Equilibrium Model

Economic Sectors: Household, Firms, and Government

The Circular Flow of Funds

THE BASIC COMPETITIVE EQUILIBRIUM MODEL

General equilibrium analysis requires a model of the entire economy. To analyze the effects of imposing a tax or the immigration of labor or any other change, one "solves" for the full equilibrium before and after the change, and looks at how each of the variables—wages, prices, interest rates, outputs, employment, and so forth—has changed.

To see how this is done, we focus on a simplified version of the full competitive equilibrium model.

In this simplified model, we assume all workers have identical skills. Ignoring differences in skill level enables us to talk about the labor market as if all workers received the same wage. Similarly, we ignore all aspects of risk in our analysis of the capital market. This allows us to use a single interest rate. Finally, we assume that all firms produce the same good; in other words, the product market consists of only one good. We now have an economy made up of three markets—the labor market, the capital market, and the product market—and can use general equilibrium analysis to trace through how they depend on one another.

In Chapter 9, we saw how households determine the amount of labor they wish to supply. Households supply labor because they want to buy goods. Hence, their labor supply depends on both wages and prices. It also depends on other sources of income. If we assume, for simplicity, that households' only other source of income is the return to their investments (their return to capital, or the interest on their investments), then we can see that the labor supply is connected to all three markets. It depends on the wage, the price of the single good, and the return to capital. Similarly, in Chapter 11, we saw that the demand for labor depends on the wage, on the interest rate, and on the price at which the firm sells its product.

Equilibrium in the labor market requires that the demand for labor equal the supply. Normally, when we draw the demand curve for labor, we simply assume that p , the price of the good(s) being produced, and the interest rate (here, r) are kept fixed. We focus our attention solely on the wage rate, the price of labor. Given p and r , we look for the wage at which the demand and supply for labor are equal. This is a partial equilibrium analysis of the labor market.

The labor market is only one of the three markets, even in our highly simplified economy. There is also the market for capital to consider. In Chapter 9, we saw how households determine their savings, which in turn determine the available supply of capital. The supply of capital is affected, in general, by the return it yields (the interest rate, r) plus the income individuals have from other sources, in particular from wages. Since the amount individuals are willing to save may depend on how well off they feel, and how well off they feel depends on the wage rate relative to prices, we can think of the supply of capital too as depending on wages, interest rates, and prices. In Chapter 11, we learned how to derive firms' demand for capital. This too will depend on the interest rate they must pay, the price at which goods can be sold, and the cost of other inputs.

Equilibrium in the capital market occurs at the point where the demand and supply for capital are equal. Again, partial equilibrium analysis of the capital market focuses on the return to capital, r , at which the demand and supply of capital are equal, but both the demand and the supply depend on the wage and the price of goods as well.

Finally, there is the market for goods. Chapters 8 and 9 showed how to derive households' demand for goods. We can think of the household as first deciding on how much to spend (Chapter 9), and then deciding how to allocate what it spends over different goods (Chapter 8). Of course, with a single consumption good, the latter problem no

longer exists. In our simplified model, then, we can think of the demand for goods at any price as being determined by household income, which in turn depends on the wage and the interest rate.

Similarly in Chapter 12, we analyzed how firms determine how much to produce: they set price equal to marginal cost, where marginal cost depends on wages and the interest rate. Equilibrium in the goods market requires that the demand for goods equal the supply of goods. Again, while in the simple partial equilibrium analysis we focus on how the demand and supply of goods depend on price, p , we know that the demand and supply of goods also depend on both the wage rate and the return to capital.

EQUILIBRIUM IN THE BASIC COMPETITIVE MODEL

The labor market clearing condition: The demand for labor must equal the supply.

The capital market clearing condition: The demand for capital must equal the supply.


The goods market clearing condition: The demand for goods must equal the supply.

The labor market is said to be in equilibrium when the demand for labor equals the supply. The product market is in equilibrium when the demand for goods equals the supply. The capital market is in equilibrium when the demand for capital equals the supply. The economy as a whole is in equilibrium only when all markets clear simultaneously (demand equals supply in all markets). The general equilibrium for our simple economy occurs at a common wage rate, w , price, p , and interest rate, r , at which all three markets are all in equilibrium.

In the basic equilibrium model, there is only a single good, but it is easy to extend the analysis to the more realistic case where there are many goods. The same web of interconnections exists between different goods and between different goods and different inputs. Recall from Chapter 4 that the demand curve depicts the quantity of a good — for instance, beer — demanded at each price; the supply curve shows the quantity of a good that firms supply at each price. But the demand curve for beer depends on the prices of other goods and the income levels of different consumers; similarly, the supply curve for beer depends on the prices of inputs, including the wage rate, the interest rate, and the price of hops and other ingredients. Those prices, in turn, depend on supply and demand in their respective markets. The general equilibrium of the economy requires finding the prices for each good and for each input such that the demand for each good equals the supply and the demand for each input equals the supply.

THE CIRCULAR FLOW OF FUNDS

General equilibrium analysis is not the only way to think about the interrelations of the various parts of the economy. Another way is to consider the flow of funds through the economy. Households buy goods and services from firms. Households supply labor and capital to firms. The income individuals receive, whether in the form of wages or the return on their savings, is spent to buy the goods that firms produce. All these transactions constitute what is called the **circular flow**.



The circular flow for a simplified economy—in which there are only households and firms, households do not save, and firms do not invest—is shown in Figure 13.3. This circular flow diagram serves two purposes. First, it keeps track of how funds flow through the economy. We can see this by starting at point A and following the circular flow around to the right. The top arrow shows that households pay money to firms to buy goods for their consumption. The lower arrow (point B) shows that firms use the money to pay household members in the form of wages (for labor), rent (to the owners of land), and profit (to the owners of firms). The second purpose of the circular flow diagram is to focus on certain balance conditions in the economy that must always be satisfied. In the case of the simple flow in Figure 13.3, there is one balance condition. The income of households (the flow of funds from firms, lower arrow) must equal the expenditures of households (the flow of funds to firms, upper arrow).

Figure 13.4 expands the circular flow in three ways. First, savings and capital are included. Thus, the funds that flow from the firm to the household now include a return on capital (interest on loans and bonds, dividends on stocks). The funds that flow from the household to the firm now include savings, which go to purchase machines and buildings. And firms now retain some of their earnings to finance investment.

Second, the circular flow now includes funds flowing into and out of the government. Thus, some households receive payments from the government (benefits like Social Security and welfare payments). Some sell their labor services to the government rather than private firms. Some receive interest on loans to the government (U.S. government bonds). And there is now an important additional outflow from households: income that goes to the government in the form of taxes. Similarly, firms have additional sources of inflow in the sales of goods and services they make to the government and in government subsidies to firms, and an additional outflow in the taxes they must pay to the government.

Just as the flow of funds into and out of households and firms must balance, the flow of funds into the

¹ We ignore here the possibility that the government can simply pay for what it obtains by printing 1 money. In the United States, the government always finances any shortfall) in revenue by borrowing.

government must balance the flow of funds out.¹ When there is a deficit — that is, when the government spends more than it collects in taxes, as has been the case in recent years — funds go into the government as borrowings. The government finances the difference by borrowing (in our diagram, from households).

Third, Figure 13.4 adds the flow to and from foreign countries. Firms sell goods to foreigners (exports) and borrow funds from foreigners. Households buy goods from foreigners (imports) and invest funds in foreign firms. Again, there must be a balance in the flow of funds into and out of the country. U.S. exports plus what the country borrows from abroad (the flow of funds from abroad) must equal its imports plus what it lends abroad (the flow of funds to other countries)?

The interconnections and balance conditions making up circular flow analysis are the same as those that arise in the competitive general equilibrium model discussed earlier in the chapter. Even if the economy were not competitive, however, the interrelationships and balance conditions of the circular flow diagram would still be true. Thus, the circular flow diagram is a useful reminder that change in one element of the economy must be balanced by change in another element, whether or not the economy is competitive.

Let's put the circular flow diagram to work. Consider a reduction in the personal income tax, such as occurred in 1981 under President Reagan. The flow of funds into the government was reduced. The circular flow diagram reminds us flows in and out must remain balanced. That is, either some other tax must be increased, government borrowing must increase, or government expenditures must decrease.

Session 7

Interfering with the Law of Supply and Demand

Price Ceiling

Price Floor

Case Study: The Communist Economy of the Former Soviet

Union

INTERFERING WITH THE LAW OF SUPPLY AND DEMAND

The law of supply and demand, which governs how prices are set, can produce results that some individuals or groups do not like. For example, a reduced supply of oil may lead to a higher equilibrium price for oil. The higher price is not a malfunction of the law of supply and demand, but this is little comfort to those who use gasoline to power their cars and oil to heat their homes. Low demand for unskilled labor may lead to very low wages for unskilled workers. An increase in the demand for apartments in New York City leads, in the short run (with an inelastic supply), to an increase in rents—to the delight of landlords, but the dismay of renters.

In each of these cases, pressure from those who did not like the outcome of market processes has led government to act. The price of oil and natural gas was, at one time, regulated; minimum wage laws set a minimum limit on what employers can pay, even if the workers are willing to work for less; and rent control laws limit what landlords can charge. The concerns behind these interferences with the market are understandable, but the agitation for government action is based on two errors.

First, someone (or some group) was assigned blame for the change: the oil price rises were blamed on the oil companies, low wages on the employer, and rent increases on the landlord. As already explained, economists emphasize the role of anonymous market forces in determining these prices. After all, if landlords or oil companies are basically the same people today as they were last week, there must be some reason that they started charging different prices this week. Sometimes the price increase is the result of producers colluding to raise prices. This was the case in 1973, when the oil-exporting countries got together to raise the price of oil. The more common situation, however, is illustrated by the increase in the price of oil in August 1990, after Iraq's invasion of Kuwait. There was no collusion this time. The higher price simply reflected the anticipated reduction in the supply of oil. People rushed to buy, increasing short-term demand and pushing up the equilibrium price.

The second error was to forget that as powerful as governments may be, they can no more repeal the law of supply and demand than they can repeal the law of gravity. When they interfere with its working, the forces of supply and demand will not be balanced. There will either be excess supply or excess demand. Shortages and surpluses create problems of their own, often worse than the original problem the government was supposed to resolve.

Two straightforward examples of government overruling the law of supply and demand are **price ceilings**,

which impose a maximum price that can be charged for a product, and **price floors**, which impose a minimum price. Rent control laws are price ceilings, and minimum wage laws and agricultural price supports are price floors. A closer look at each will help highlight the perils of interfering with the law of supply and demand

PRICE CEILINGS: THE CASE OF RENT CONTROL

an artificial scarcity.

Price ceilings—setting a maximum charge—are always tempting to governments because they seem an easy way to assure that everyone will be able to afford particular product. Thus, in the last couple of decades in the United States, price ceilings have been set for a wide range of goods, from chickens to oil to interest rates. In each case the result has been to create shortages at the controlled price. People want to buy more of a good than producers want to sell, because producers have no incentive to produce more of the good. Those who can buy at the cheaper price

benefit; producers and those unable to buy suffer.

The effect of rent control laws — setting the maximum rent that a landlord can charge for a one-bedroom apartment, for example — is illustrated by Figure 5.12. In panel A, R^* is the market equilibrium rental rate, at which the demand for housing equals the supply. However, the local government is concerned that at , many poor people cannot afford housing in the city, so it imposes a law that says that rents may be no higher than R_I . At R_I , there is an excess demand for apartments. While the motives behind the government action may well have been praiseworthy, the government has created

The problems caused by rent control are likely to be worse in the long run than in the short run, because long-run supply curves are more elastic than short-run supply curves. In the short run, the quantity of apartments does not change much. But in the long run, the quantity of apartments can decline for several reasons, as landlords try to minimize the losses from rent control. Apartments may be abandoned as they deteriorate; they can be converted to condominiums and sold instead of rented; and apartment owners may not wish to construct new ones if they cannot charge enough in rent to cover their costs.

Figure 5.12B illustrates how the housing shortages under rent control will increase over time. Rent control results in all existing renters being better off, at least as long as the landlord stays in the business. But the quantity of available rental housing will decrease, so that many would-be residents will be unable to find rental housing in the market. Since renters tend to be poorer than those who can buy a home, a shortage of rental housing will tend to hurt the poor most.

Figure 5.12 A PRICE CEILING : RENT CONTROL

Rent control laws limit the rents apartment owners may charge. If rents are held down to R_I , below the market-clearing level R^* , as in panel A, there will be excess demand for apartments. Panel B shows the long-run response. The supply of rental housing is more elastic in the long run, since landlords can refuse to build new apartment buildings, or they can sell existing apartments as condominiums. The price ceiling eventually leads to the quantity supplied being even farther below the quantity demanded.

PRICE FLOORS : THE CASE OF AGRICULTURAL

Just as consumers try to get government to limit the prices they pay, sellers would like the government to put a floor on the prices they receive: a minimum wage for workers and a minimum price on wheat and other agricultural products for farmers. Both groups appeal to fairness. The price they are receiving is inadequate to cover the effort (and other resources) they are contributing.

Farmers, because of their political influence, have succeeded in persuading government to impose a floor on the prices of many agricultural products — a price which is above the market equilibrium, as illustrated in Figure 5.13. The consequences should be obvious: supply exceeds demand. To sustain the price, government has had to purchase and stockpile huge amounts of agricultural goods. The cost of supporting the price at these above market levels has been in the billions — at the peak, in 1986, the government spent over \$25 billion, or an average of more than \$11,000 for every farmer.

As government interferes with the law of supply and demand, it is led into a labyrinth of problems. To reduce supplies, it has imposed production limitations. Imposing limitations is not only administratively cumbersome, but impedes the adaptability of the market. This is because quotas are based on past production, but some areas should be expanding, and others contracting, in response to changed circumstances. The quota system does not allow this to happen easily. Worse still, wheat farmers have to keep producing wheat, lest they lose their quota. But this means that they cannot rotate their crops — and this is bad for the soil and the environment. To avoid the build up of surpluses, Congress has enacted a program to subsidize exports. But these subsidies have angered other countries, which view it as unfair competition. Our subsidies of wheat exports to Mexico have hurt our economic relations with Argentina. Even Mexico has viewed them with alarm, as they have interfered with Mexico's attempts to reform its agricultural sector.

Government is aware of these problems, but the political pressures to maintain high prices kept the price support program in place for a long time. The agricultural bill passed in 1996 is intended to lead to a phase-out for most major crops.

The Communist Economy of the Former Soviet Union

The rise and subsequent collapse of communism must certainly be one of the major events of the 20th century. As a set of ideas, communism developed in the 19th century. But it did not become a major force in the world until the creation of the Soviet Union following the Russian Revolution (1917). During World War II the Soviet armed forces brought communism by force to much of Eastern Europe. Political revolutions also brought communism to China, North Korea, Vietnam, and Cuba. The result was the Cold War. In the 1980s, communism began to change considerably. Communist countries took on more and more of the characteristics of market economies. By the early 1990s, communism had collapsed completely in the former Soviet Union and in Eastern Europe. As of this writing, China, Vietnam, North

Korea and Cuba still have communist economies. But they are very different from the period before 1980. Indeed, China has become basically a market economy, as we will see later. At the beginning of the new millennium, market economies have become totally dominant among the countries of the world. In this chapter, we will focus on the former Soviet Union. We will look at the basic components of a communist economy. Then we will try to assess how well the communist economic system performed and why reforms to that system failed. In the next chapter, we will discuss the attempt by Russia over the past 15 years to transform itself from a communist economy into a market, capitalist economy.

1. The Components of a Communist Economy

In Chapter 1, we introduced the terms "socialism" and "communism". By our definitions, socialism occurs where

the government owns and controls most of the capital goods. A socialist economy becomes 'communist' when the government is not a democratically-elected one. The former Soviet Union was probably the best example of a prototype communist economy from its inception in 1918 until its collapse in 1991. Indeed, most of the other communist countries patterned their economies on what had been done in the former Soviet Union.

To analyze communist economies in detail would take a complete volume. In this chapter, let us focus on a few key components. These are: (a) The Big Push, (b) State-Owned Enterprises with a Soft Budget Constraint, (c) Central Planning, (d) Collective Farming, (e) A Shortage Economy, and (f) Trade Autarky. To get a picture of a communist economy, we examine each of these in turn.

(a) The Big Push

All of the countries that adopted communist economies did so at a time of considerable economic backwardness. For either military or political reasons, they all believed that they needed to industrialize very quickly. Upon taking power in the Soviet Union in 1929, Stalin prophetically stated that his country would have ten years to overcome 100 years of backwardness if it wished to survive. (His country was invaded by Hitler's armed forces just twelve years later.) In order to industrialize quickly, it was believed that a very high portion of all production had to be production of capital goods, with considerable emphasis on steel and other materials needed for the military. The focus therefore was to be on large, capital intensive projects in "heavy industry". Normal consumer goods and housing had to be discouraged in order to channel resources into production of these capital goods.

The need to channel resources into these priority areas required the government to have considerable control over the economy. This was accomplished through a highly centralized Communist Party. The Communist Party made all major appointments, promotions, and dismissals in the enterprises that came to comprise the Soviet economy. Those who refused to carry out the orders of the Party leadership could quickly see their careers ruined.

(b) State Owned Enterprises With a Soft Budget Constraint

As noted above, in a socialist economy, capital goods are owned by the government. In the former Soviet Union, all enterprises (and all land) were indeed owned by the government. Those who managed the enterprises were bureaucrats. They were most likely to have been members of the Communist Party, as this was the path to any career success. As with all decision-makers, we have to look at the incentives they face to see how the enterprises will behave. In the former Soviet Union, there seem to have been two main incentives facing enterprise managers. First, there were incentives for meeting the plan targets. We discuss central planning in the next section. There were many plan targets to meet. But the one with the greatest rewards was the target for production. Meeting the production target would bring the managers of the enterprises considerable financial reward (a bonus that could add 25% to 30% to one's income) as well as prestige. Consistent failure to meet the production targets meant the loss of the bonus, reduced promotion prospects, and possibly the loss of one's job.

This passion to meet the target for production was dysfunctional for at least two reasons. First, the managers of the enterprise desired to meet the target but not to exceed it. Exceeding the target this year would certainly mean an increase in the plan target next year. The result was that production often went along at a slow pace until the last three days of the month, followed by a frantic pace of production to meet the monthly target. This phenomenon was called "storming" and was obviously very inefficient. Second, this passion to meet the target for production was dysfunctional because it made enterprise managers very resistant to change and innovation. If an innovation were a failure, the plan target would not be met. If the innovation were a success, the result would be that the plan target for next year would be raised.

Second, there were incentives for enterprise managers in the former Soviet Union to push for enterprise expansion. This seems to be a ubiquitous goal of bureaucrats. For the manager of the enterprise, power and prestige increased as the size of the enterprise increased. Managers of Soviet enterprises tended to ask for more funds for new capital goods than they actually needed. To increase the chances that their requests would be approved, they would underestimate the costs of the capital goods and the completion time. This phenomenon has been called "investment hunger" — where investment refers to the buying or building of new capital goods. Those higher up in the bureaucracy often approved the increase in capital goods because they saw this as part of the "Big Push".

This "investment hunger" was also dysfunctional for at least two reasons. First, the government commonly permitted the buying or building of more capital goods than it could possibly afford. When it realized that it was over-extended, the government would then slow the building or buying of all the projects simultaneously. The result of this was that many projects stayed only partially completed for years and years. Second, enterprises in the former Soviet Union became very large. In the entire country, there were perhaps only 50,000 manufacturing enterprises of any kind. They averaged more than ten times the number of employees as would be found in a typical American company. By becoming so large, they became very hard to manage. As a result of companies being too large, costs of production rose — a phenomenon called diseconomies of scale. This passion for very large companies has been called "Gigantomania".

Notice that, when we examine the main goals of the managers of enterprises in the former Soviet Union, we did not include profits. Managers of Soviet enterprises did receive a target concerning profits. The profits target was supposed to force enterprises to produce efficiently. But, at all levels of the Soviet bureaucracy, meeting the production target was much more important than any other target. If an enterprise met the production target while its costs exceeded its revenues, it would receive assistance from the government. This assistance was commonly a direct subsidy. Companies never had to worry about costs, as they knew that any losses would be covered by the government. This phenomenon has been called the "soft budget constraint". The result, as you might guess, is that Soviet enterprises were very inefficient. (The term "soft budget constraint" is a play on the words "hard budget constraint in which a company or division must live within a fixed budget.")

(c) Central Planning

In the former Soviet Union, central planning largely replaced the market. Planners' preferences replaced consumers' preferences. Generally, there was a five-year plan (to set major goals and priorities) and an annual plan. The annual plan would set the plan targets that were discussed in the previous section. This annual plan began with targets for production for the entire economy. These targets were then broken down by sector, such as agriculture, industry, transportation, and so forth. From there, the plan was continually disaggregated until it reached the enterprise level. But the final plan targets were not simply imposed on the enterprise. There was considerable bargaining between the enterprise director and the planning authorities. The final plan targets determined the quantities of each good that would be produced by the enterprise, the materials that each enterprise would be allowed to have (as well as the company from which the enterprise was to buy these materials and the price it would pay), the number of workers that would be allowed as well as the total wages that could be paid, and so forth. For a large enterprise, there could be as many as 200 different plan targets to meet. Meeting the plan targets was mandatory, although, as noted in the last section, managers realized that meeting the production target was by far the most important. It has been estimated that the planning for production and for the allocation of materials was undertaken for 30,000 to perhaps 60,000 products. A plan for one year would commonly be something like 12,000 pages.

For about 4,000 of these products, the former Soviet Union attempted a Materials Balance. First, for each product, the planners would estimate the sources — how much would be produced or imported. Then they would estimate the uses — how much would be used in production, consumed, or exported. For each product, the sources and the uses

had to balance. Since many of the products were interrelated, achieving a balance of any kind for all products was extremely difficult. (For example, anything that affected the materials balance for iron would also affect the materials balance for steel which would affect the materials balance for machinery and so on.) For this reason, planning was typically done "on the margin". This means that the planners would begin with last year's plan, whether it was good or not, and then make a few changes for the coming year. Central planning proved to be a virtually impossible task. Can you imagine a group of people planning production of 30,000 to 60,000 products (remember that one company's production then had to be part of the materials allocation for another company) in a country of over 300 million people that spoke over 100 languages and that spanned eleven time zones?

Central planning also led to certain dysfunctional behaviors. For example, a manager of an enterprise would, of course, want as easy a production target as possible and as plentiful a supply of materials and labor as possible. In order to achieve that, the enterprise manager would distort information. Commonly, he or she would try to make superiors believe that the enterprise had a capacity to produce a smaller quantity than it really had. Or materials would be reported as "lost or damaged in shipment" and then stored for future use. Enterprises commonly hired people to go around the country and bribe the directors of other enterprises in order to obtain needed materials. This, of course, was illegal. Materials were commonly being used for purposes not specified in the plan. For another example, if the materials allocated to an enterprise were not sufficient to meet the plan target, the enterprise would simply lie about the product it had produced. For example, if there were not enough leather, a shoe company might produce what is really a size 6 shoe and label it as size 8. And for yet a final example, there was the problem of the unit of measurement for the production target. If production were measured in weight, the products would be very heavy. If production were measured in number of units, the products would be very flimsy. One famous cartoon had an enterprise director standing next to an absolutely gigantic nail and telling his colleague how he had met the production quota for that year.

(d) Collective Farming

When a country is beginning to develop economically, the agricultural sector has four major functions.

(1) It must provide food for the people plus raw materials (such as cotton) for industry. (2) Since most of the population is engaged in agriculture, people must be shifted to manufacturing to provide the labor force that will allow manufacturing industries to grow. (3) It must be the source of most of the savings that will pay for the investment in new capital goods. (4) And finally it must provide export products to earn foreign exchange to buy the imported materials that industries need.

To achieve these results, the former Soviet Union decided to have agriculture collectivized.

Collectivization was done in a very bloody and destructive manner in the

1930s. Soviet farms were basically of two types. The first was the State Farm. This was a farm but operated like any other enterprise --- a factory in the fields. The second was the Collective Farm.

Technically, this was a cooperative. It was "owned" by the workers who received a basic Wage plus a bonus based on the performance of the collective farm. While the Chair of the collective farm was supposed to be chosen by the workers, in reality, the Chair was chosen by the Communist Party. The collective farms were given plan targets, just as any other enterprise. But anything they produced above the plan targets could be sold on collective farm markets at higher prices. As you might expect from the description of the Soviet enterprise, the farms in the former Soviet Union were very large ("Gigantomania"). Collective farms commonly averaged more than 16,000 acres and State Farms averaged more than 40,000 acres.

Throughout most of the Soviet period, agriculture rarely performed as intended. Over these years, there were many attempts at reform. None of these changed the basic character of Soviet agriculture. Let us examine how Soviet agriculture performed based on the functions specified above. (1) Soviet agricultural production rarely reached the goals of the planners. Indeed, the growth rate of agricultural production was quite low by any standard. In the 1970s, it was estimated that agricultural production per worker was only 6% that of the United States and that production per machine was only 33% that of the United States. (2) The labor force in agriculture did fall, as intended, to provide workers for the growing industries. But it did not fall very much. For example, from 1970 to 1983, the agricultural labor force fell by only 700,000 people out of a total of 26.8 million. The labor force for the growing industries had to come from forcing almost all married women to work. (3) The Soviet government tried to extract savings from farm workers through high taxes. This money was to be invested in industry, not agriculture. Because of this policy, agricultural infrastructure was poor. About one-fifth of all grain, fruit, and vegetables would perish due to poor storage facilities. At least 20% of all tractors would be out of service at any given time. And the roads were so poor that a major use for those tractors that did operate was to pull trucks out of the mud. Because of these problems, the Soviet government decided in the 1980s to invest more resources in agriculture. As they did so, they were taking savings away from industry to pay for investments in agriculture, exactly the opposite of what they had intended. Finally, (4) rather than provide export products, Soviet agriculture performed so poorly that large quantities of meat and grain had to be imported. In the mid-1970* the Soviet Union and the United States agreed to two large sales of wheat to the Soviet Union (known to some in the United States as the "Great Grain Robbery").

Probably most embarrassing for the Soviet authorities was the role of private plots. State farm members, collective farm members, and city dwellers had access to private plots. These were very small — less than one acre. They were operated with spade, hoe, and sickle technology and worked by wives or retirees. Yet these private plots were responsible for 60% of all potatoes grown, 40% of all fruits, berries, and nuts, 30% of all meat, milk, and vegetables, and 25% of all agricultural production.

(e) A Shortage Economy

In the former Soviet Union, prices were not determined by demand and supply. Indeed, in most cases, prices were set below market-level prices and were rarely changed. The result was shortages of most consumer goods. The shortages were most commonly resolved by distribution on a first-come, first served basis. Long lines were pervasive throughout the former Soviet Union. It was common for people who had worked a full day to spend two more hours in line shopping — 5 or 6 days a week. If one had a recipe that required three or more ingredients, one could be assured that at least one of these ingredients would not be available at all. The average waiting time for housing was ten to fifteen years. The average waiting time for an automobile or a telephone was over three years. The pervasiveness of shortages led to forced savings -- called a "monetary overhang". This means that people had income but could not find anything to spend it on. So, unwillingly, they saved it.

Distribution on a first-come, first-served basis was not the only means to resolve the shortage problem. In some cases, there was "seller choice". Those most favored were members of the Communist Party. And it was not uncommon for workers in stores to hide some goods and then sell them to friends and family.

A shortage economy leads to black markets. In the former Soviet Union, this was called the Second Economy. Large amounts of clothing and housing services (such as repairs) were sold in the black market at high prices. Blue jeans, in particular, could command a very high price. As mentioned above, enterprise managers hired individuals to go around the country buying materials on a black market. Truck drivers would divert cargo and then sell it on a black market. Foreign goods would be smuggled into the country. People would steal materials from their places of

employment and use them to construct summer homes and other amenities. (Stealing from the government was not looked down on in the former Soviet Union.) Bribery of government officials was a fact of everyday life.

There were also shortages in the labor market. Workers were free to move between jobs. Workers were generally hard to find while jobs were easy to find. A common result was shirking by workers. Workers would show up for work, leave in the morning, go shopping or drinking, and then return to work in the afternoon to punch out. These workers would not be fired because there was no one to replace them.

(f) Trade Autarky

The last aspect of the economy of the former Soviet Union was a complete aversion to international trade. This was called "*autarky*" and resulted from the government seeing other countries as 'the enemy'. Imports were limited to those necessary goods that could not be produced at home. Exports, mainly from agriculture, were to earn the money to pay for these imports. All international trade was handled by specific agencies; with a few exceptions, enterprises could not trade directly with companies in other countries. The Russian Ruble was not convertible into foreign monies. Transactions involving foreign exchange were tightly controlled by the government. The price charged for a good within the Soviet Union and the price charge in international trade had virtually no relation to each other.

2. Economic Performance of the Former Soviet Union

This description of the economy of the former Soviet Union is a description of an economy modeled on the military. Those at the top gave the orders and others obeyed. The use of markets was more limited than in most other countries. The economic performance of this type of economic system was generally unsatisfactory. Let us examine this performance.

There are many measures of economic performance. But since the goal of the planners was economic growth, let us focus just on this measure. According to official Soviet statistics, from 1950 to 1984, production in the former Soviet Union grew at an annual rate of 7.6%. American estimates had this growth rate much lower at 4.4%. This would mean that, each year, the former Soviet Union would produce 4.4% more goods and services than the year before. During the same period, the American economy grew at an annual rate of 3.4%. Especially during the 1950s, when Americans thought that the former Soviet economy was growing at an annual rate of 6⁰/01 there was great fear that the Soviet Union would catch up with, or even overtake, the United States.

While the Soviet rate of economic growth in this period looks very good, two important points need to be noted. First, according to American estimates, the growth of the economy of the former Soviet Union slowed consistently over this time. From 6% in the 1950s, the Soviet economy grew 5.1% in the 1960s, 3.7% in the 1970s, and only 2% from 1980 — 1984. The second point is that, after communism ended and Soviet records were made available to Americans, we learned that American estimates of Soviet growth were too high. The economy of the former Soviet Union was actually performing more poorly than we had thought. By the mid-1980s, production in the Soviet Union may not have been growing at all.

Economic growth can be of two types. One is called "*extensive growth*". This growth occurs because of increases in the quantities of the various factors of production (more labor, more capital, and so forth). The other is called "*intensive growth*". This growth occurs because of the ability to make better use of those factors of production that exist (more productive workers, better technologies, and so forth). The relatively high growth rates of the 1950s and 1960s reflected extensive growth. By 1970, the ability to grow by through extensive growth was beginning to run out as the quantities of both labor and capital were growing slower than previously. The low growth rates after 1970

indicate that the Soviet economy was not doing a good job at increasing the productivity of its workers nor of improving its technologies. The best measure we have of this is quantity produced per unit of input, where "input" includes both labor and capital. (This measure is called "total factor productivity".) In the 1950s: this measure rose at an annual rate of 1.7% per year in the former Soviet Union. From 1960 to 1981, it rose at an annual rate of only 0.8%. And from 1983 to 1987, it actually fell at an annual rate of 0.7%. The former Soviet Union was not only behind the countries of the West, it was losing ground. By the middle of the 1980s, the leaders of the former Soviet Union had come to believe that their country had little chance of achieving a desirable rate of economic growth without making fundamental changes in the economic system.

3. Reform of the Soviet Communist Economy

The last half of the 1980s was a period of perestroika, meaning restructuring. This was the plan of the Soviet leader, Mikhail Gorbachev, to reform the economy without changing its basic communist character.

Perestroika had several aspects. These are discussed in detail in the next chapter.

It is important to note what perestroika did not do. (1) It did not allow for a change in property arrangements. Enterprises were still owned and controlled by the government. State farms and collective farms in agriculture were retained. (2) It did not create prices that were determined by demand and supply.

(3) It reduced, but did not eliminate, central planning. (4) It did not open the country to international trade, although it did allow enterprises, for the first time, to enter into foreign trade agreements on their own.

In all, perestroika only made marginal changes in the economy. And it was implemented slowly over time. The slow implementation meant that enterprises were in continual confusion. (A joke in a Soviet humor magazine went this way. The government sends an emissary to Britain to try to discover why the traffic accident rate is so low in Britain. The emissary returns and reports to the Minister of Transportation that the reason is that the British drive on the left side of the road. "Good", say the Minister. "We'll do that too. But we'll start with just the trucks." If one can imagine the trucks on the left side and the cars on the right side, one gets a good sense of the confusion caused by the slow implementation of reform.)

Enterprises could now make deals with each other. But there was no legal system to enforce the deals. And there were no wholesale markets to reduce the transactions costs of making the deals. Some prices were freely negotiated and some were set by the government. Some production had to be sold to the government while other production did not. The rules were constantly changing. Because perestroika was resisted by those in high government positions, no one could be sure that the reforms would last. As we will see in the next chapter, this confusion caused production to actually fall in 1989 and 1990. And between 1985 and 1989, the budget deficit more than doubled. This means that the government was spending much more than it was taking in as tax revenues. Rubles were being created at very rapid rates to pay for these budget deficits. This increase in money available, at a time production was falling, created very great shortages. In response, many of the changes of perestroika were reversed. It was an admission of failure.

In August of 1991, communism collapsed completely after a failed coup against Gorbachev by hardline party members. The former Soviet Union broke into different countries. The Cold War was over. In 1991, Boris Yeltsin took over as the leader of Russia, the largest part of what had been the Soviet Union. Since that time, Russia has attempted a rapid transition to a market, capitalist country. Nothing like this had ever been attempted. So far, there have been some clear successes and some clear failures in that attempt. We begin the discussion of the transition

from a communist economy to a market, capitalist economy in Chapter 14.

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